

FM 5055B LOT #3

C-02133

p. 188

FINGERPRINT TEST DATA REPORT

NAS8-36298

COPY # 21

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NAS8-36298

U.S. Polymeric O.E. 71108

Filler Lot for NASA Lot# 3

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FILLER TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

Filler Lot for NASA Lot# 3

1. Carbon Content, % QAI-5560	SAMPLE			
	#3A-1	#3A-2	#3A-3	
	99.40	99.32	99.44	
	NASA LOT# 3	AVERAGE	99.39	
2. Ash Content, % PTH-71B	0.000	0.000	0.000	
	0.000	0.000	0.005	
	AVG. 0.000	0.000	0.002	
	NASA LOT# 3	AVERAGE	0.001	
3. Atomic Absorption, ppm CTM-53B (Values are average of 2 determinations)	#3A-1	#3A-2	#3A-3	LOT#3
	Na 6.0	6.0	6.0	AVG. 6.0
	K 2.5	1.0	2.0	1.8
	Ca 2.5	2.5	2.0	2.3
	Mg 0.0	0.0	0.0	0.0
	Li 0.0	0.0	0.0	0.0
	TOTAL 11.0	9.5	10.0	10.2
3a. Moisture Content, % CTM-53B	.010	.015	0.000	
	.005	.020	0.000	
	AVG. .008	.018	0.000	
	NASA LOT# 3	AVERAGE	.008	
3b. Ash Content, % CTM-53B	.025	.000	.000	
	.025	.010	.000	
	AVG. .025	.005	.000	
	NASA LOT# 3	AVERAGE	.010	
4. pH, Units ASTM D1512	4.80	4.75	4.85	
	4.95	4.80	4.80	
	AVG. 4.88	4.78	4.82	
	NASA LOT# 3	AVERAGE	4.83	
5. Particle Size, microns S.E.M. procedure (Average values are of 20 determinations)	AVG. .51	.51	.42	
	Maximum .99	.88	.85	
	Minimum .20	.18	.15	
	Std. Dev .23	.20	.17	
	NASA LOT# 3	AVERAGE SIZE	.48	
6a. TGA, °C at 50% Loss CTM-51	864	860	850	
	NASA LOT# 3	AVERAGE	858	

Filler Lot for NASA Lot# 3

6b. TGA
CTM-51

See Charts 6A-6C

7. Particle Size Distribution
CTM-72

See Charts 7A-7C

7a. Particle Size, microns
CTM-72

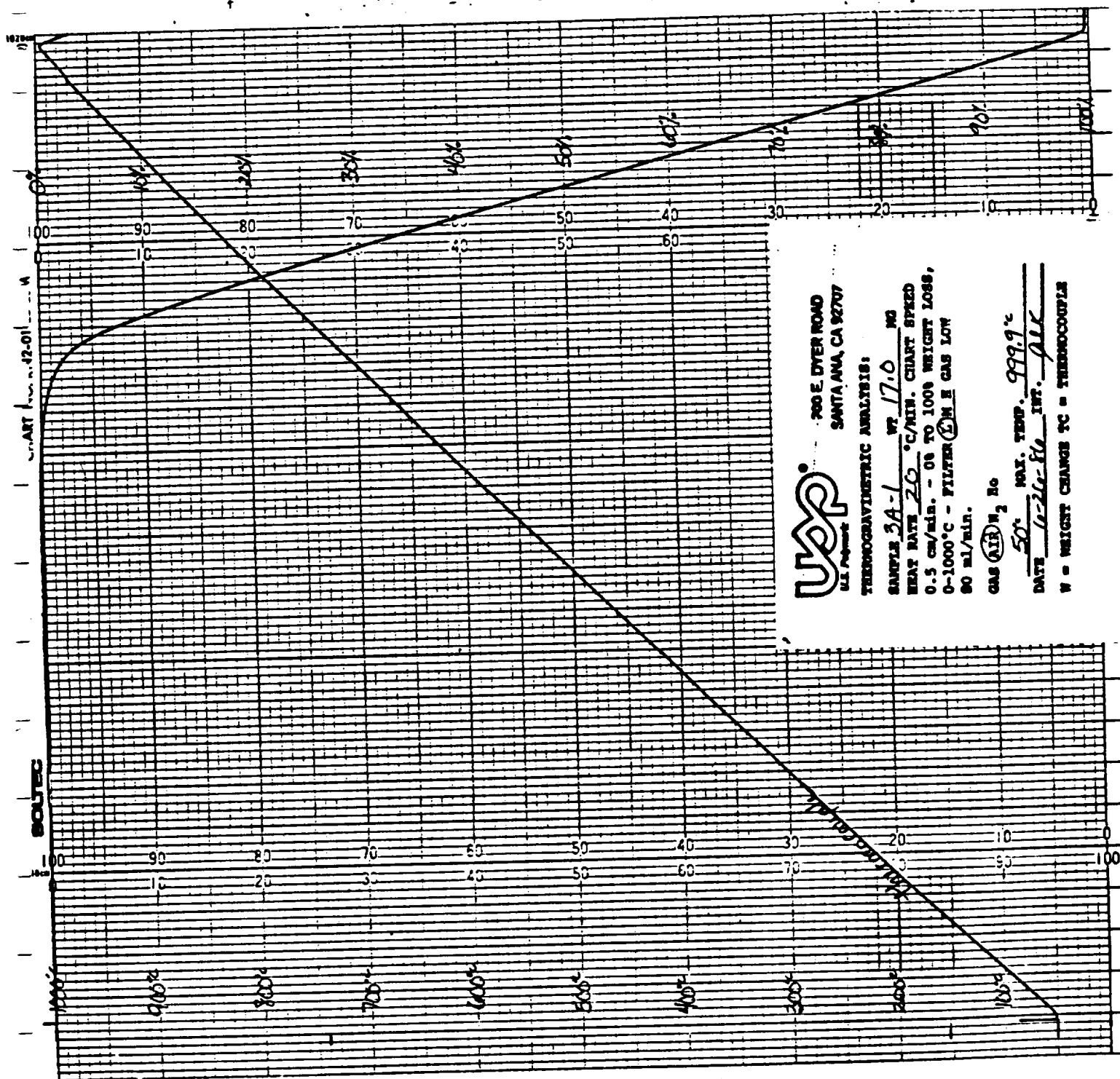
	<u>#3A-1</u>	<u>#3A-2</u>	<u>#3A-3</u>
	.89	.94	.89
	<u>.94</u>	<u>.83</u>	<u>.86</u>
AVG.	.92	.88	.88
NASA LOT# 3	AVERAGE		.89

U.S. Polymeric

Hamid M. Quraishi

Hamid M. Quraishi, Manager
Quality Assurance Department

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WAP
200 E DYER ROAD
SANTA ANA, CA 92707

TECHNOGRAVIMETRIC ANALYSIS:

SAMPLE 3A-1 WT 17.0 MG
HEAT RATE 20 °C/MIN. CHART SPEED
0.5 cm/min. - 06 TO 100% WEIGHT LOSS,
0-1000°C - FILTER 2 M H GAS LOW
90 ml/min.

GAS AIR N₂ He
50° MAX. TEMP. 999.9 °C
DATE 11-26-80 INT. gik
W = WEIGHT CHANGE TC = THERMOCOUPLE

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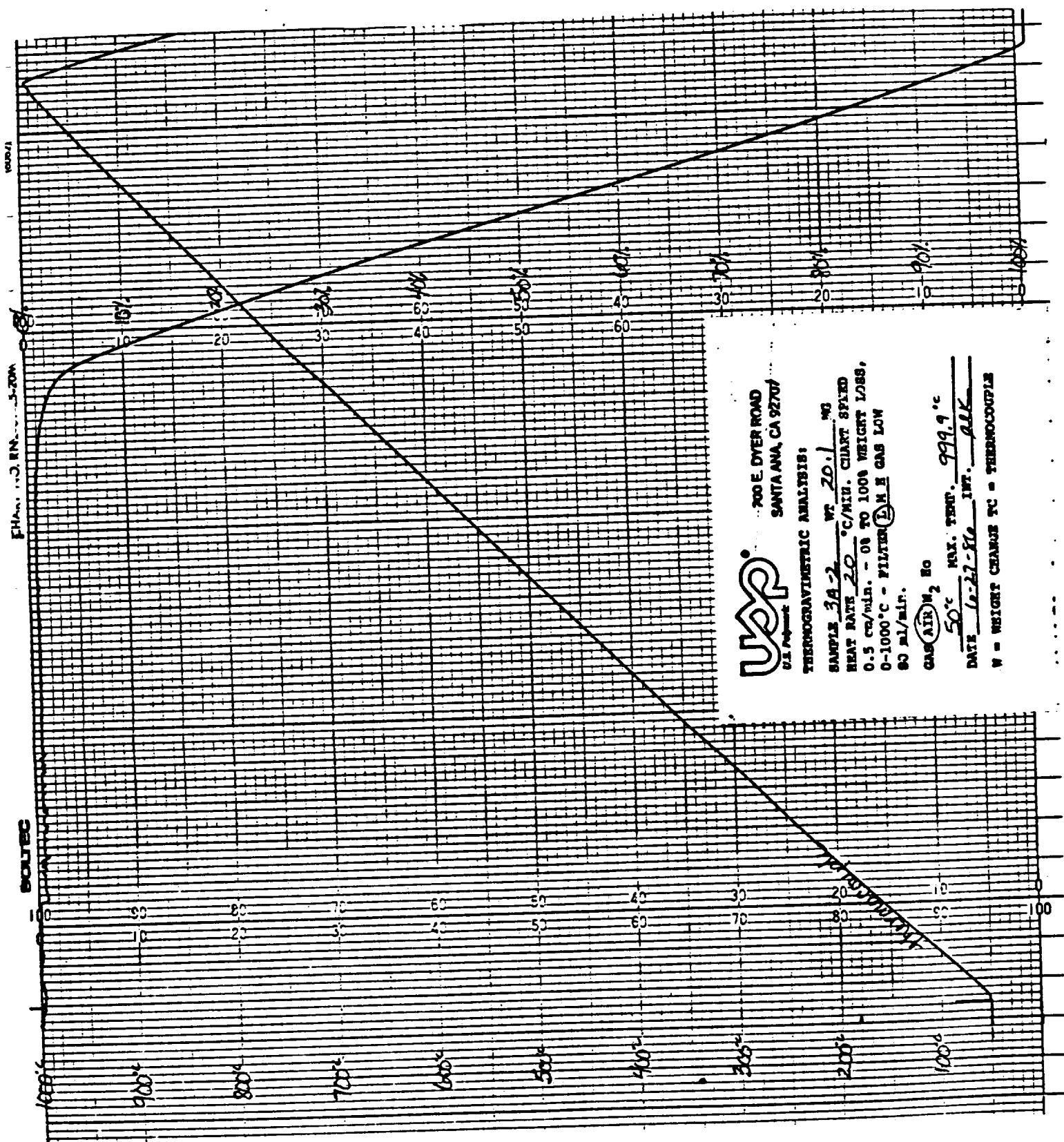
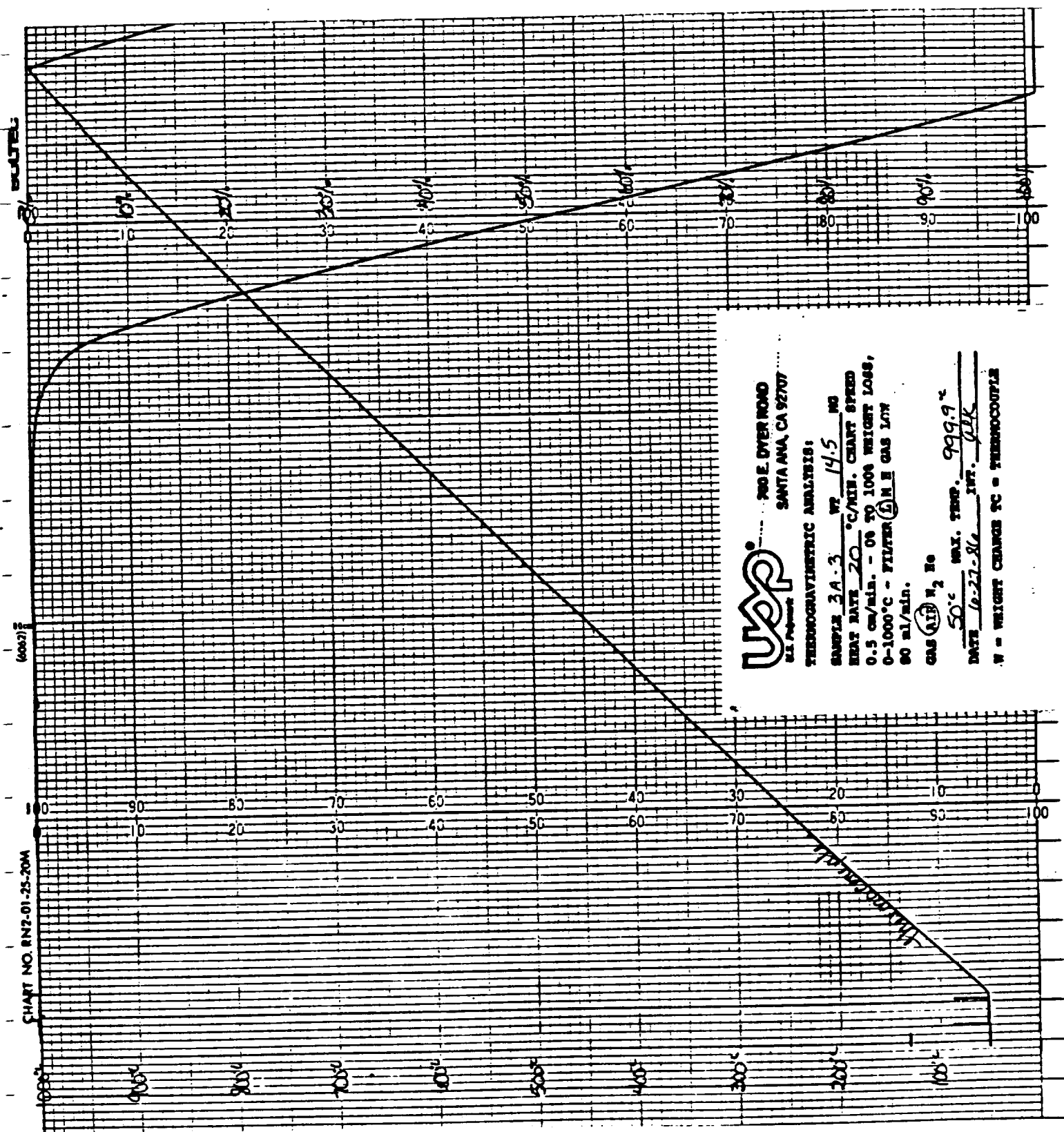


CHART 6C



* DISTRIBUTION TABLE (BY VOL.)

HORIBA CAPA-500
PARTICLE ANALYZER

DATE 5-27-86
SAMPLE NASA LOT#3A1
#2 SOLVENT ETHYL GLYCOL
C=0.01 mg/ml
* CONDITIONS

SOLV. VISC 19.90(CP)
SOLV. DENS 1.11(G/CC)
SAMP. DENS 1.90(G/CC)
D(MAX) 5.0 (PM)
D(MIN) 0.01(PM)
D(DIV) 0.50(PM)
SPEED 5000. (RPM)

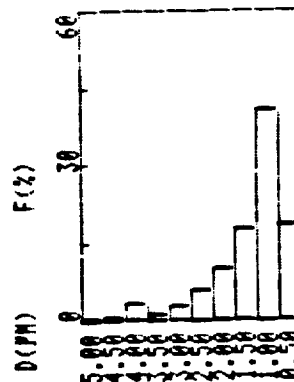
* DISTRIBUTION TABLE (BY VOL.)

HORIBA CAPA-500
PARTICLE ANALYZER

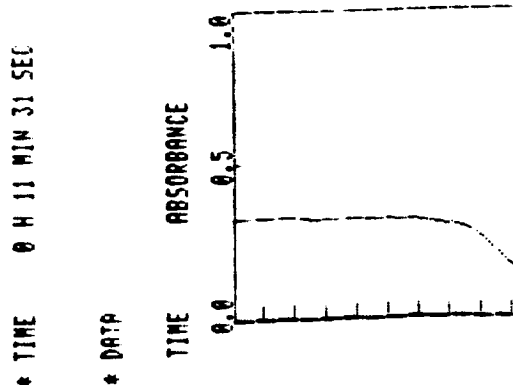
DATE 5-27-86
SAMPLE NASA LOT#3A1
#1 SOLVENT ETHYL GLYCOL
C=0.01 mg/ml
* CONDITIONS

SOLV. VISC 19.90(CP)
SOLV. DENS 1.11(G/CC)
SAMP. DENS 1.90(G/CC)
D(MAX) 5.0 (PM)
D(MIN) 0.01(PM)
D(DIV) 0.50(PM)
SPEED 5000. (RPM)

* DISTRIBUTION GRAPH (BY VOL.)



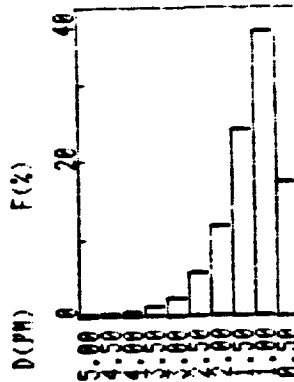
Lot#3A-1
Sample #1



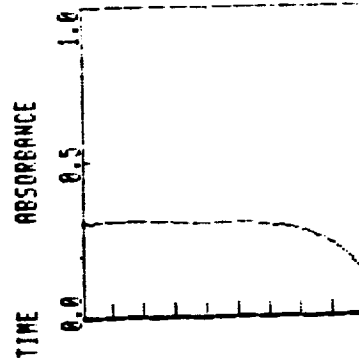
* TIME 0 H 11 MIN 31 SEC

* DATA

* DISTRIBUTION GRAPH (BY VOL.)



Lot#3A-1
Sample #2



* TIME 0 H 11 MIN 31 SEC

* DATA

HORIBA CAPA-500
PARTICLE ANALYZER

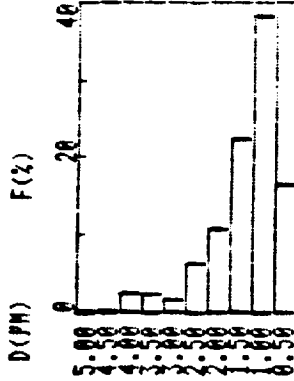
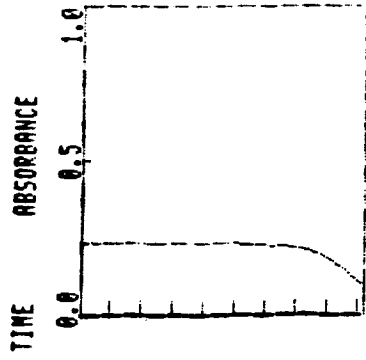
DATE 5-23-86
SAMPLE NASA Lot# 3A2
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV. VISC 19.90 (CP)
SOLV. DENS 1.11 (G/CC)
SAMP. DENS 1.90 (G/CC)
D (MAX) 5.0 (PM)
D (MIN) 0.01 (PM)
D (DIV) 0.50 (PM)
SPEED 5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA



Lot# 3A2
Sample #1

* DISTRIBUTION TABLE (BY VOL.)

D (PM)	F (%)	R (%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	2.3	2.3
3.50-3.00	2.4	4.7
3.00-2.50	1.5	6.2
2.50-2.00	6.2	12.5
2.00-1.50	10.6	23.1
1.50-1.00	22.3	45.4
1.00-0.50	38.4	83.8
0.50-0.00	16.2	100.0
D (AVE)	0.94 (PM)	

* DISTRIBUTION GRAPH (BY VOL.)

HORIBA CAPA-500
PARTICLE ANALYZER

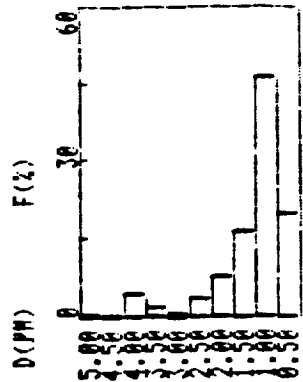
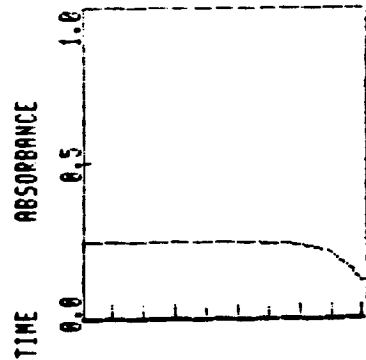
DATE 5-23-86
SAMPLE NASA Lot# 3A2
SOLVENT ETHYL GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV. VISC 19.90 (CP)
SOLV. DENS 1.11 (G/CC)
SAMP. DENS 1.90 (G/CC)
D (MAX) 5.0 (PM)
D (MIN) 0.01 (PM)
D (DIV) 0.50 (PM)
SPEED 5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA



Lot# 3A2
Sample #2

* DISTRIBUTION GRAPH (BY VOL.)

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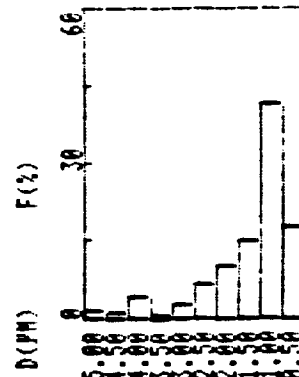
* DISTRIBUTION TABLE (BY VOL.)

D (PM)	F (%)	R (%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.0	0.0
4.00-3.50	4.2	4.2
3.50-3.00	1.6	5.9
3.00-2.50	0.6	6.4
2.50-2.00	3.6	10.0
2.00-1.50	7.8	17.8
1.50-1.00	16.3	34.2
1.00-0.50	46.3	80.5
0.50-0.00	19.5	100.0
D (AVE)	0.83 (PM)	

* DISTRIBUTION TABLE (BY VOL.)

D(PH)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	1.4	1.4
4.50-4.00	0.9	2.3
4.00-3.50	4.2	6.5
3.50-3.00	0.3	6.9
3.00-2.50	2.5	9.4
2.50-2.00	6.5	15.9
2.00-1.50	10.0	25.9
1.50-1.00	14.8	40.7
1.00-0.50	41.7	82.3
0.50-0.00	17.7	100.0
D(AVE)	0.89 (PH)	

* DISTRIBUTION GRAPH (BY VOL.)



Lot #3A-3
Sample #1

HORIBA CAPA-500
PARTICLE ANALYZER

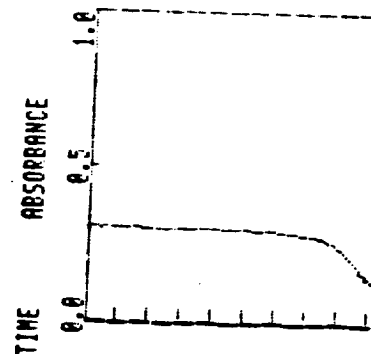
DATE 5-23-86
#2 SAMPLE NASA LOT#3A-3
SOLVENT ETHYLENE GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV.VISC 19.90(CP)
SOLV.DENS 1.11(G/CC)
SAMP.DENS 1.90(G/CC)
D(MAX) 5.0 (PH)
D(MIN) 0.01(PH)
D(DIV) 0.50(PH)
SPEED 5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

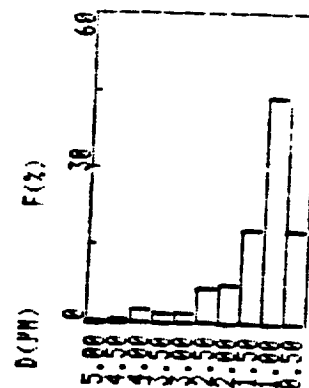
* DATA



* DISTRIBUTION TABLE (BY VOL.)

D(PH)	F(%)	R(%)
5.00 <	0.0	0.0
5.00-4.50	0.0	0.0
4.50-4.00	0.5	0.5
4.00-3.50	2.3	2.8
3.50-3.00	1.8	4.5
3.00-2.50	1.8	6.3
2.50-2.00	6.6	12.9
2.00-1.50	7.5	20.3
1.50-1.00	17.8	38.1
1.00-0.50	44.0	82.1
0.50-0.00	17.9	100.0
D(AVE)	0.86 (PH)	

* DISTRIBUTION GRAPH (BY VOL.)



Lot #3A-3
Sample #2

HORIBA CAPA-500
PARTICLE ANALYZER

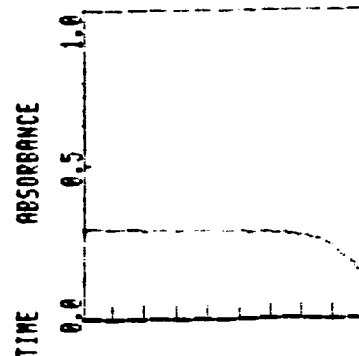
DATE 5-23-86
#1 SAMPLE NASA LOT#3A-3
SOLVENT ETHYLENE GLYCOL
C=0.01 mg/ml

* CONDITIONS

SOLV.VISC 19.90(CP)
SOLV.DENS 1.11(G/CC)
SAMP.DENS 1.90(G/CC)
D(MAX) 5.0 (PH)
D(MIN) 0.01(PH)
D(DIV) 0.50(PH)
SPEED 5000. (RPM)

* TIME 0 H 11 MIN 31 SEC

* DATA



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RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

91LD Resin Lot for NASA Lot# 3

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6. Gas Chromatography.....	1
7. TGA.....	1
8. DSC.....	1
9. HPLC.....	1
10. GPC.....	1
11. pH.....	2
12. Phenol Content.....	2
13. Chang's Index.....	2
14. RDS.....	2
15. NMR.....	2

CHARTS

Gas Chromatography.....	6A - 6C
TGA.....	7A - 7C
DSC.....	8A - 8C
HPLC.....	9A - 9C
GPC.....	10A - 10C
RDS.....	14A - 14C
NMR.....	15A - 15C



RESIN TESTING

NAS8-36298

U.S. Polymeric O.E. 71108

91LD Resin Lot for NASA Lot# 3

1. Resin Solids, %
PTM-7C

	#3-1	#3-2	#3-3
	71.8	71.6	71.3
	71.4	71.8	72.3
	<u>71.8</u>	<u>70.5</u>	<u>71.3</u>
AVG.	71.7	71.3	71.6
	Lot# 3	AVERAGE	71.5

2. Specific Gravity @ 25°C
PTM-29C

	1.129	1.131	1.128
	Lot# 3	AVERAGE	1.129

3. Viscosity, Brookfield, cps. @ 22.8°C
PTM-14C

	1250	1375	1250
	Lot# 3	AVERAGE	1292

4. Gel Time, min:sec
PTM-47B

	3:40	3:38	3:33
	Lot# 3	AVERAGE	3:37

5. Atomic Absorption, ppm
CTM-53B

	#3-1	#3-2	#3-3	LOT1	AVG
Na	8	14	14	12.0	
K	0	0	0	0.0	
Ca	5	5	5	5.0	
Mg	1	1	1	1.0	
Li	<u>1</u>	<u>1</u>	<u>1</u>	<u>1.0</u>	
AVG.	15	21	21	19.0	

6. Volatiles, Gas Chromatography
CTM-55

See Charts 6A-6C

7. TGA, % Weight Loss at 500°C
CTM-51 (AIR)

	#3-1	#3-2	#3-3
	38.7	38.5	38.2
	Lot# 3	AVERAGE	38.5

8. DSC, temperature °C
CTM-50A

See Chart 7A-7C

	178	183	185
	Lot# 3	AVERAGE	182

See Chart 8A-8C

9. HPLC
CTM-49A

See Chart 9A-9C

10. GPC, Average molecular wt.
CTM-49A

	1666	1751	1838
	Lot# 3	AVERAGE	1752

See Chart 10A-10C

91LD Resin Lot for NASA Lot# 3

11. pH, units CTM-1B	<u>#3-1</u>	<u>#3-2</u>	<u>#3-3</u>
	8.5	8.5	8.55
	Lot# 3	AVERAGE	8.5
12. Phenol Content, % CTM-55 Appendix 1	12.22	11.92	11.72
	<u>12.57</u>	<u>12.10</u>	<u>11.73</u>
	AVG. 12.39	12.01	11.72
	Lot# 3	AVERAGE	12.04
13. Chang's Index, ml. CTM-5B	24.8	24.6	25.2
	Lot# 3	AVERAGE	24.9
14. RDS, Minimum Viscosity, cps. CTM-57A	<u>Min. Visc.</u>		<u>°C</u>
	#3-1	179	107
	#3-2	212	115
	#3-3	201	107
	AVG.	197	110

See Charts 14A-14C

See Charts 15A-15C

15. NMR
Vendor procedure

U. S. Polymeric

Hamid M. Quraishi
Hamid M. Quraishi, Manager
Quality Assurance Department

TYPICAL GAS CHROMATOGRAPH SET-UP

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Operator <u>J. A. Z.</u>	Date <u>12/10/86</u>
Column <u>6 ft.</u>	Detector <u>FID</u>
Length <u>1/4 in.</u>	Voltage <u> </u>
Dia. <u>1/4 in.</u>	Sensit. <u> </u>
Liquid Phase <u>AT-1000</u>	Flow Rates, ml/min
Wt. % <u>0.1</u>	Hydrogen <u>60</u> Air <u>96</u>
Support <u>GRAPHAC</u>	Scavenge <u> </u>
Mesh <u>80/100</u>	Split <u> </u>
Carrier Gas <u>He</u>	Temperature, °C
Rotameter <u> </u>	Det. <u>200</u> Inj. <u>200</u>
Inlet Press <u>60</u> psig	Column Initial <u>60</u>
Rate <u>30</u> ml/min	Final <u>210</u>
CHART SPEED <u> </u>	Rate <u>5cc/MIN</u>
SAMPLE <u>91 LD, 3-I</u>	Solvent <u>THF</u>
Size <u>0.1 ul</u>	Concn. <u>0.0494</u> <u>g/ml</u>

GAS CHROMATOGRAPHY STANDARD SOLVENT

TEST METHOD CTM-55

STANDARD SOLVENT/MONOMER

RETENTION TIME (MINS.)

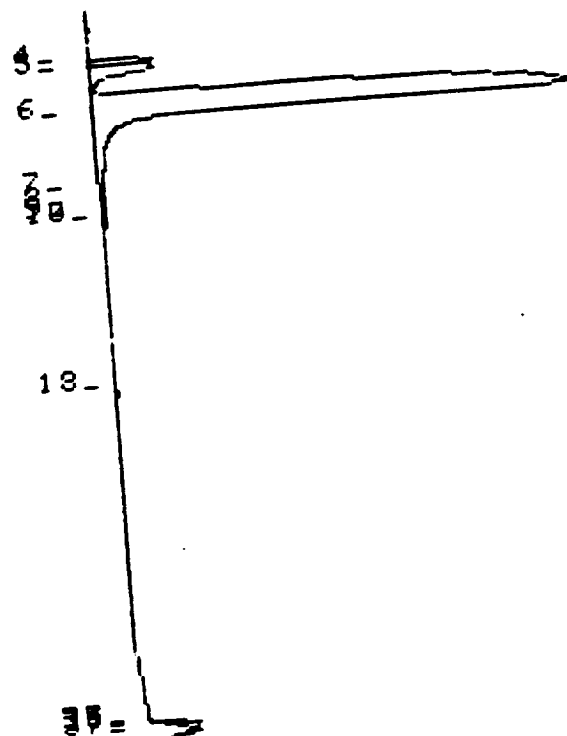
	.6
MEOH	1.18
ETHANOL	1.28
MECL2	1.45
ACETONE	1.83
IPA	3.08
THF	3.2
ACETONITRILE	4.03
CRESOL	4.08
MEK	15.03
FURFURAL	17.98
TOLUENE	19.6
CHLOROBENZENE	22.08
PHENOL	

NOTE: THF WAS USED TO DILUTE THE RESIN SAMPLES.

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VERTICAL SCALE FACTOR: 1X

*** REAL TIME CHROMATOGRAM ***



FINAL FULL SCALE MV.=1000.00

SAMPLE: 91 LD 3-1
MISC.: C=0.09941 GMS/ML

SAMPLE: 91 LD 3-1
MISC.: C=0.09941 GMS/ML

TIME: 17:40
DATE: 12/10/86
OPERATOR: JGZ

TIME: 17:40
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	L	PEAK HT.
2	1.63	3625	0.091	1	433
4	1.63	115080	2.876	2	11211
5	1.88	215000	5.374	2	11219
6	3.33	3548900	88.707	3	86537
7	5.58	11738	.293	4	573
8	5.98	10483	.262	4	391
9	6.35	4501	.112	4	395
10	6.58	19617	.490	4	376
18	11.75	10886	.272	2	519
35	21.95	35525	.888	2	5295
36	22.08	12068	.302	2	1684
37	22.20	13296	.332	1	1675

TOTAL AREA= 4000718
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 1000

PK NO.	RET TIME	PEAK AREA	AREA %	L	PEAK HT.
4	1.63	115080	2.882	2	11211
5	1.88	215000	5.385	2	11219
6	3.33	3548900	88.887	3	86537
7	5.58	11738	.294	4	573
8	5.98	10483	.263	4	391
10	6.58	19617	.491	4	376
18	11.75	10886	.273	2	519
35	21.95	35525	.890	2	5295
36	22.08	12068	.302	2	1684
37	22.20	13296	.333	1	1675

TOTAL AREA= 3992593
THRESHOLD= 1
MIN PK WIDTH= 15
AREA REJECT= 5000

** REAL TIME CHROMATOGRAM **



FINAL FULL SCALE MV.=1000.00

SAMPLE 91 LD 3-2
MISC. C=0.10126 GMS/ML

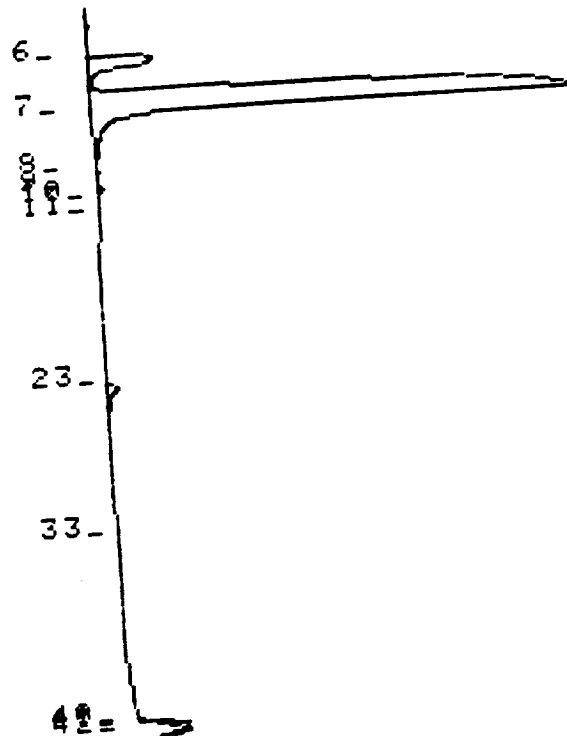
TIME: 18:24
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	L	PEAK HT.
3	.63	1800	.053	1	276
6	1.70	250680	7.316	2	11092
7	3.30	3049400	88.991	3	84633
8	5.10	10194	.297	4	409
9	5.58	14229	.415	3	996
10	5.98	2416	.071	4	96
11	6.40	1369	.040	4	98
23	11.68	35297	1.030	3	1855
33	16.25	2731	.080	1	140
40	21.95	34535	1.008	2	5148
41	22.08	10786	.315	2	1570
42	22.20	13211	.386	1	1686

TOTAL AREA= 3426648
THRESHOLD= 1
MIN. PK. WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR: 1X



SAMPLE 91 LD 3-2
MISC. C=0.10126 GMS/ML

TIME: 18:24
DATE: 12/10/86
OPERATOR: JGZ

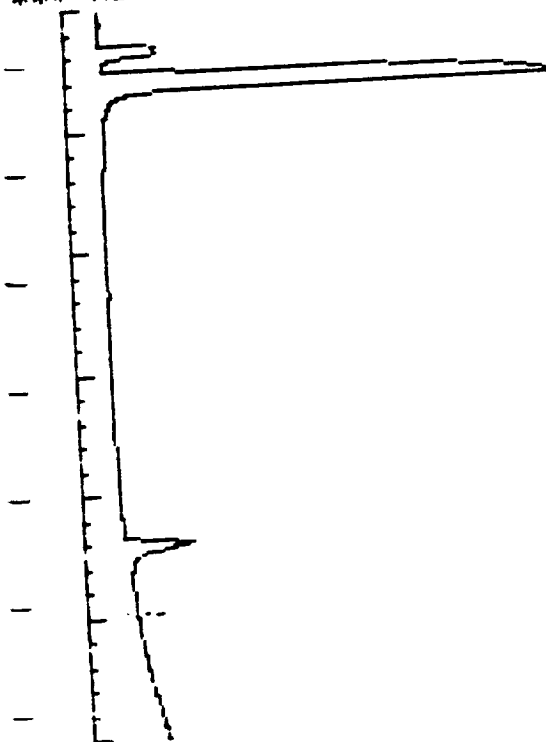
RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	L	PEAK HT.
6	1.70	250680	7.333	2	11092
7	3.30	3049400	89.207	3	84633
8	5.10	10194	.298	4	409
9	5.58	14229	.416	3	996
23	11.68	35297	1.033	3	1855
40	21.95	34535	1.010	2	5148
41	22.08	10786	.316	2	1570
42	22.20	13211	.386	1	1686

TOTAL AREA= 3416332
THRESHOLD= 1
MIN. PK. WIDTH= 15
AREA REJECT= 5000

ORIGINAL PAGE IS
OF POOR QUALITY

*** REAL TIME CHROMATOGRAM ***



FINAL FULL SCALE MV.=1000.00

SAMPLE: 91 LD 3-3
MISC.: C=0.10052 GMS/ML

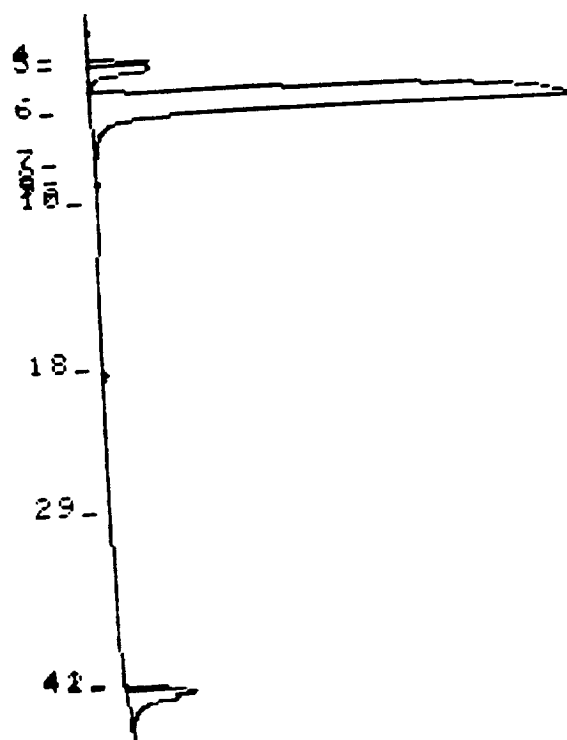
TIME: 19:08
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
2	1.63	5795	1.135	2	579
4	1.63	77409	1.808	2	10929
5	1.90	241490	5.639	2	10997
6	3.40	3546900	82.826	3	85797
7	5.10	7286	1.170	4	258
8	5.60	7111	1.166	4	547
9	5.98	4081	0.095	4	189
10	6.40	3260	0.076	4	152
18	11.73	15339	0.358	1	829
29	16.38	1188	0.028	2	51
41	21.93	54630	1.276	2	9517
42	22.05	317880	7.423	3	12752

TOTAL AREA= 4282369
THRESHOLD= 1
MIN. PK. WIDTH= 15
AREA REJECT= 1000

VERTICAL SCALE FACTOR: 1X



SAMPLE: 91 LD 3-3
MISC.: C=0.10052 GMS/ML

TIME: 19:08
DATE: 12/10/86
OPERATOR: JGZ

RUN TIME: 30.00 MINUTES
DELAY TIME: 0.00
CHAN: 0

PK NO.	RET TIME	PEAK AREA	AREA %	B L	PEAK HT.
4	1.63	77409	1.820	2	10929
5	1.90	241490	5.677	2	10997
6	3.40	3546900	83.385	3	85797
18	11.73	15339	0.361	1	829
41	21.93	54630	1.284	2	9517
42	22.05	317880	7.473	3	12752

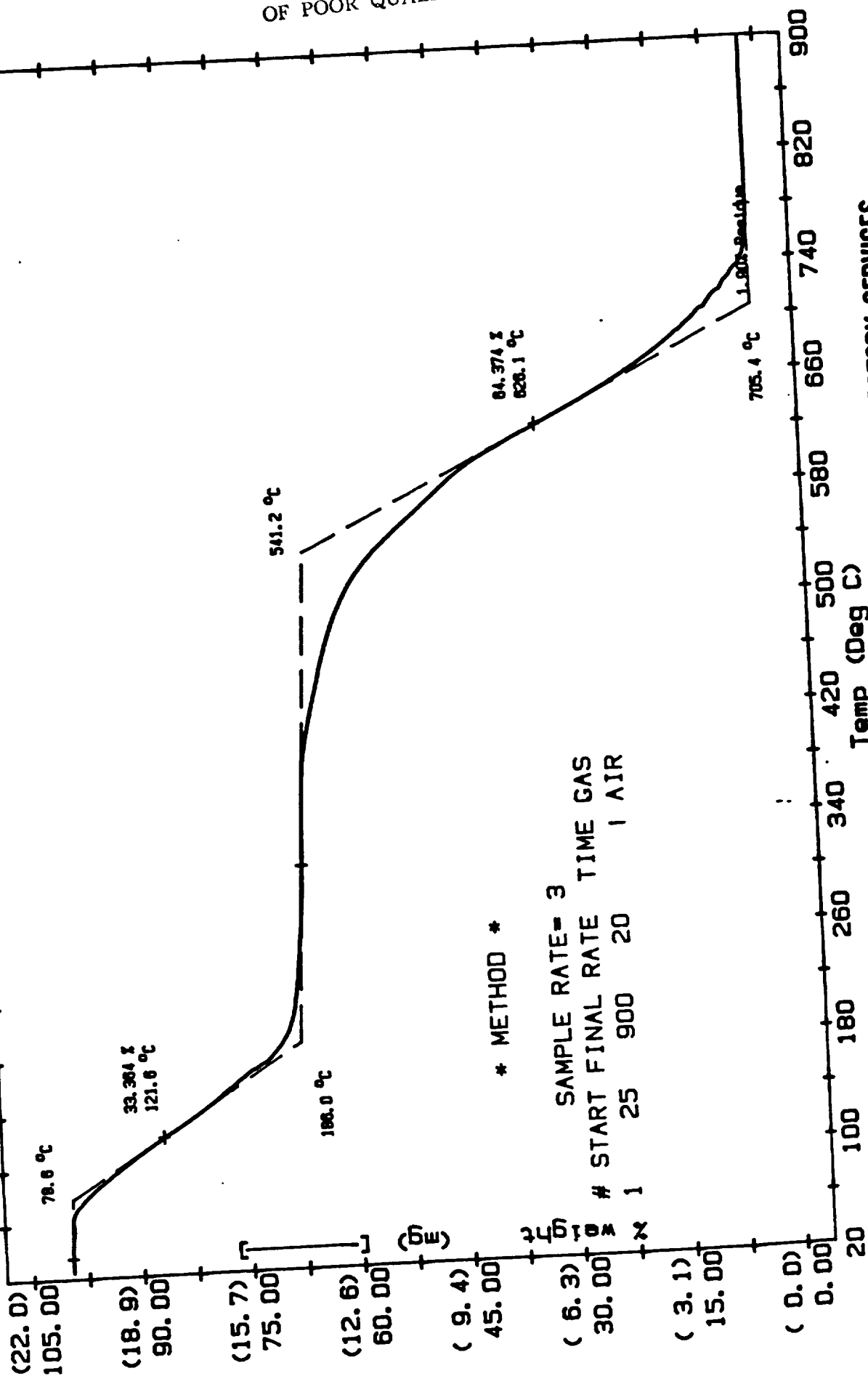
TOTAL AREA= 4253648
THRESHOLD= 1
MIN. PK. WIDTH= 15
AREA REJECT= 10000

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OF POOR QUALITY

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 6.DAT V2.1
Plotted: MAY/28/86 08:03

TGA
OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Sample: 91-LD 71108/3-1
Size: 21.009 mg
Run No: MIR #13103 (12)
Date: MAY/27/86 12:47



* METHOD *

SAMPLE RATE= 3
START FINAL RATE TIME GAS
1 25 900 20 1 AIR

ANALYTICAL LABORATORY SERVICES

Beckman Industrial

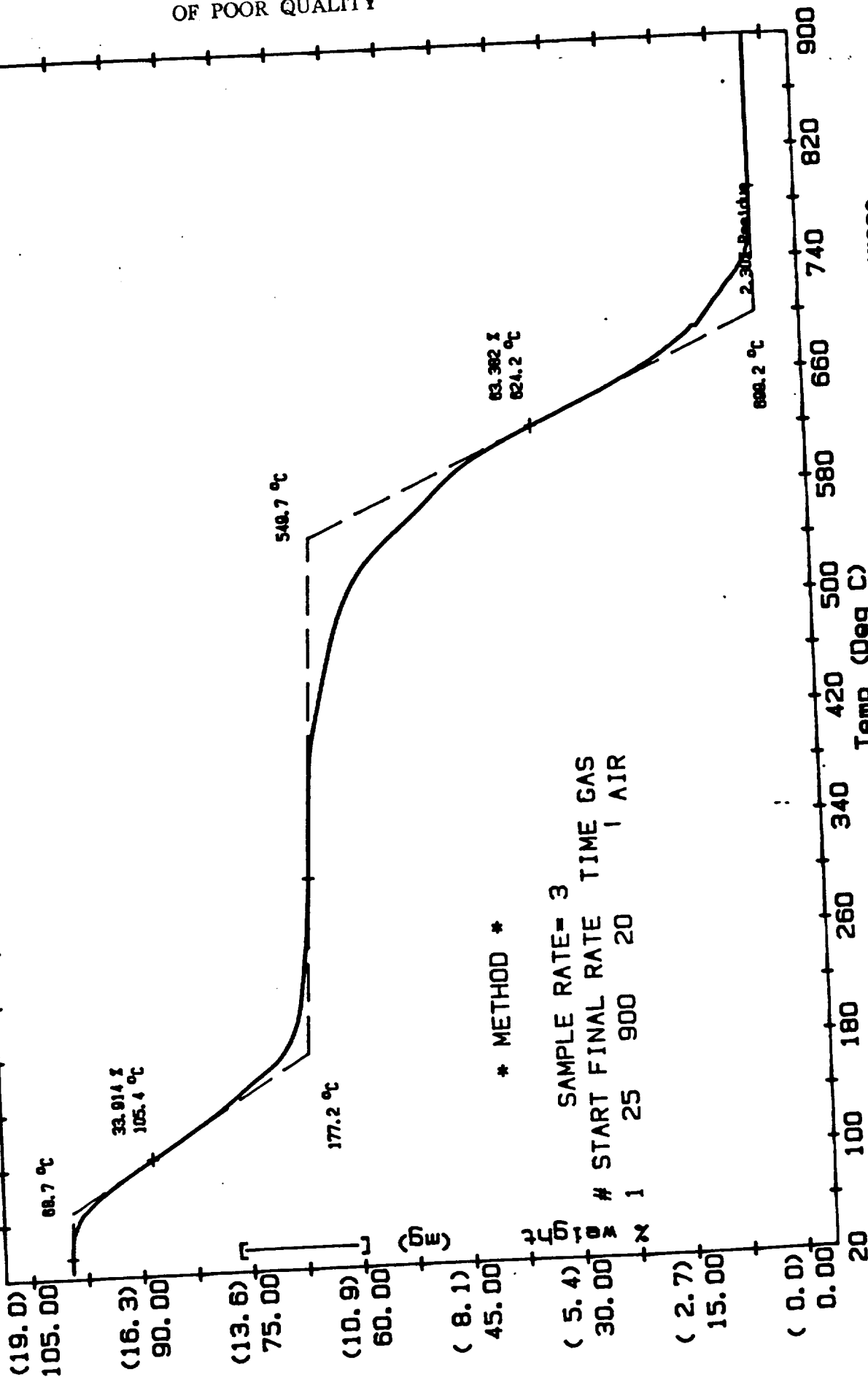
ORIGINAL PAGE IS
OF POOR QUALITY

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 7.DAT V2.1
Plotted: MAY/28/86 08:11

TGA

OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Sample: 91-LD 71108/3-2
Size: 18.179 mg
Run No: MIR #13103 (12)
Date: MAY/27/86 14:00



* METHOD *

SAMPLE RATE= 3
START FINAL RATE TIME GAS
1 25 900 20 1 AIR

ANALYTICAL LABORATORY SERVICES

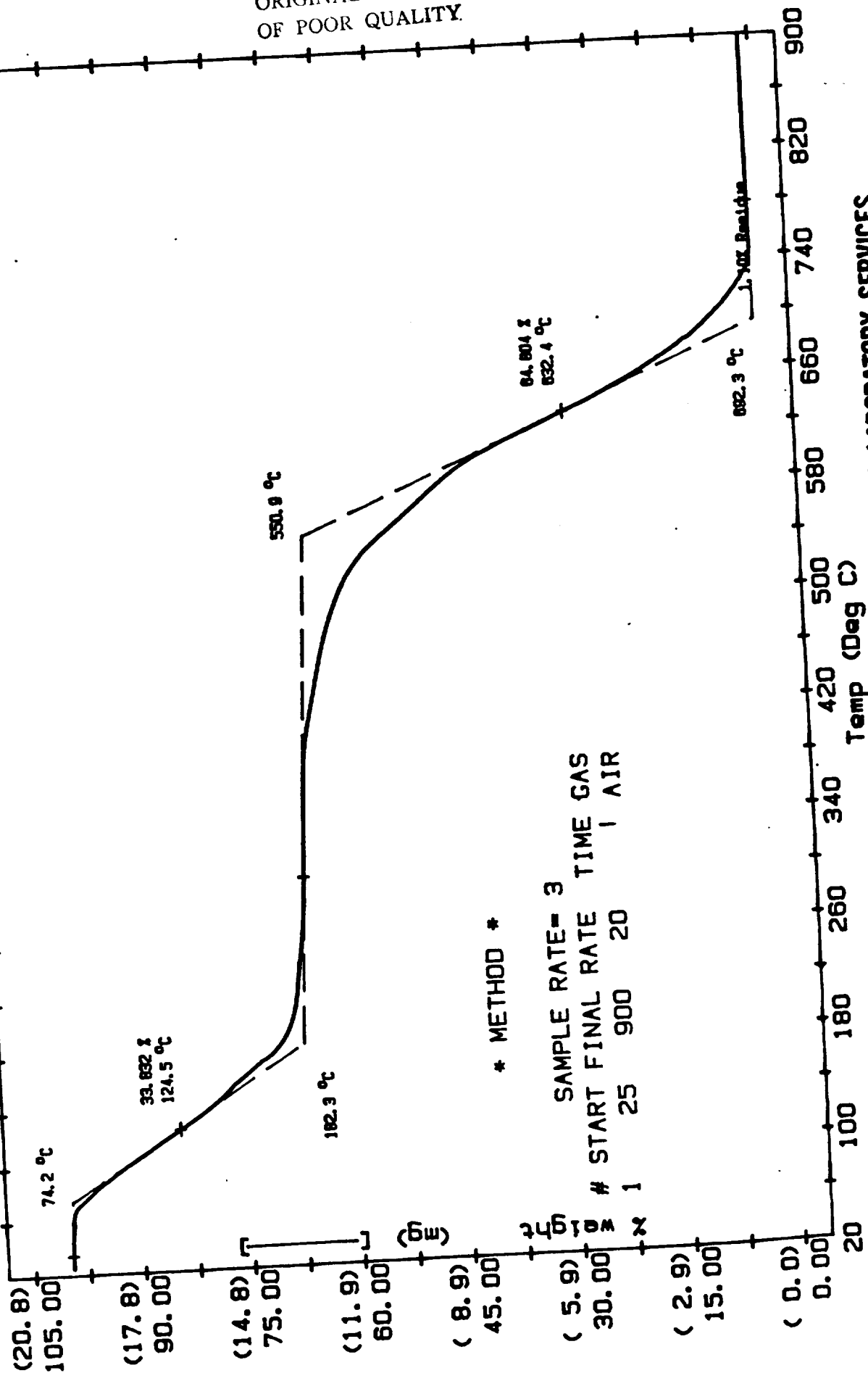
Beckman Industrial

ORIGINAL PAGE IS
OF POOR QUALITY

Operator: M. WEGENER
Disk ID: DATA DISK #108
File No: D 8.DAT V2.1
Plotted: MAY/28/86 08:15

TGA
OMNITHERM DATA SYSTEM
BECKMAN INDUSTRIAL

Sample: 91-LD 71108/3-3
Size: 19.841 mg
Run No: MIR #13103 (12)
Date: MAY/28/86 06:56



* METHOD *

SAMPLE RATE= 3
START FINAL RATE TIME GAS
1 25 900 20 1 AIR

ANALYTICAL LABORATORY SERVICES

Beckman Industrial

U.S. POLYMERIC DSC-2

Sample ID: 3 Wt: 0.35 mg
 Heat Rate: 20 °C/min Range: 20
 Recorder Span: 50 mV Chart speed: 10
 Temp. Limits: Lower 50 Upper 350
 Mode: Hold/Auto/Cool Cycle Cooling Rate: 10 °C/min
 Operator: A. K. Kelley Date: 9-2-86

9-8-86 LAST CALIBRATION DATE
 -2.1° CALIBRATION DELTA °C

EXOTHERM

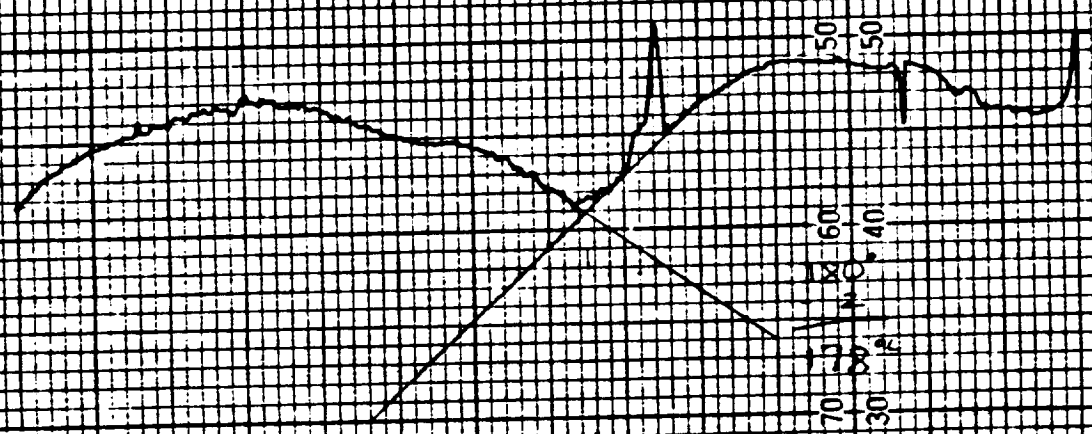


CHART 8A

SOURCE

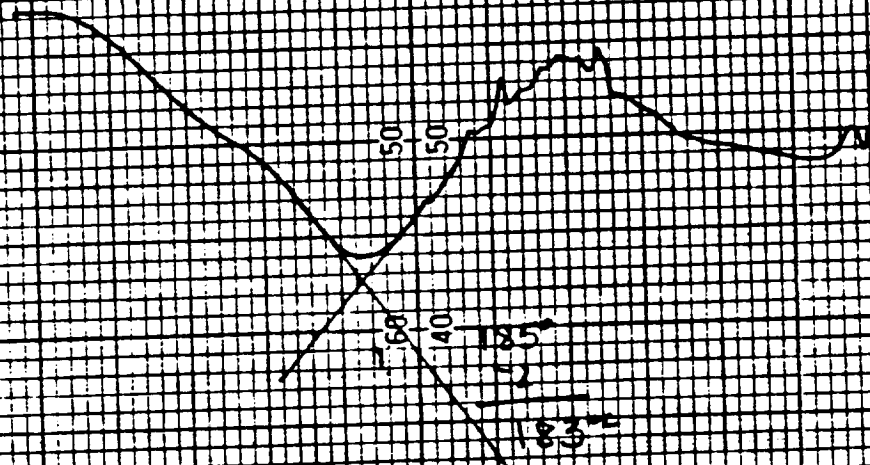
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U.S. POLYMER INC.

Sample No. 10-2-2 We. 5.7 mg
 Heat Rate 20 °C/min Range 2-8 breaks/sec
 Recorder Speed 50 in./min Chart Speed 1/8 in./min
 Temp. Limits Lower 50 Upper 350 °C
 Mode Hold Autocool Cycle Cooling Rate 40 °C/min
 Operator A. K. Kelly Date 9-8-86

9-8-86 LAST CALIBRATION DATE
 +2 °C CALIBRATION DELTA °C

EXOTHERM



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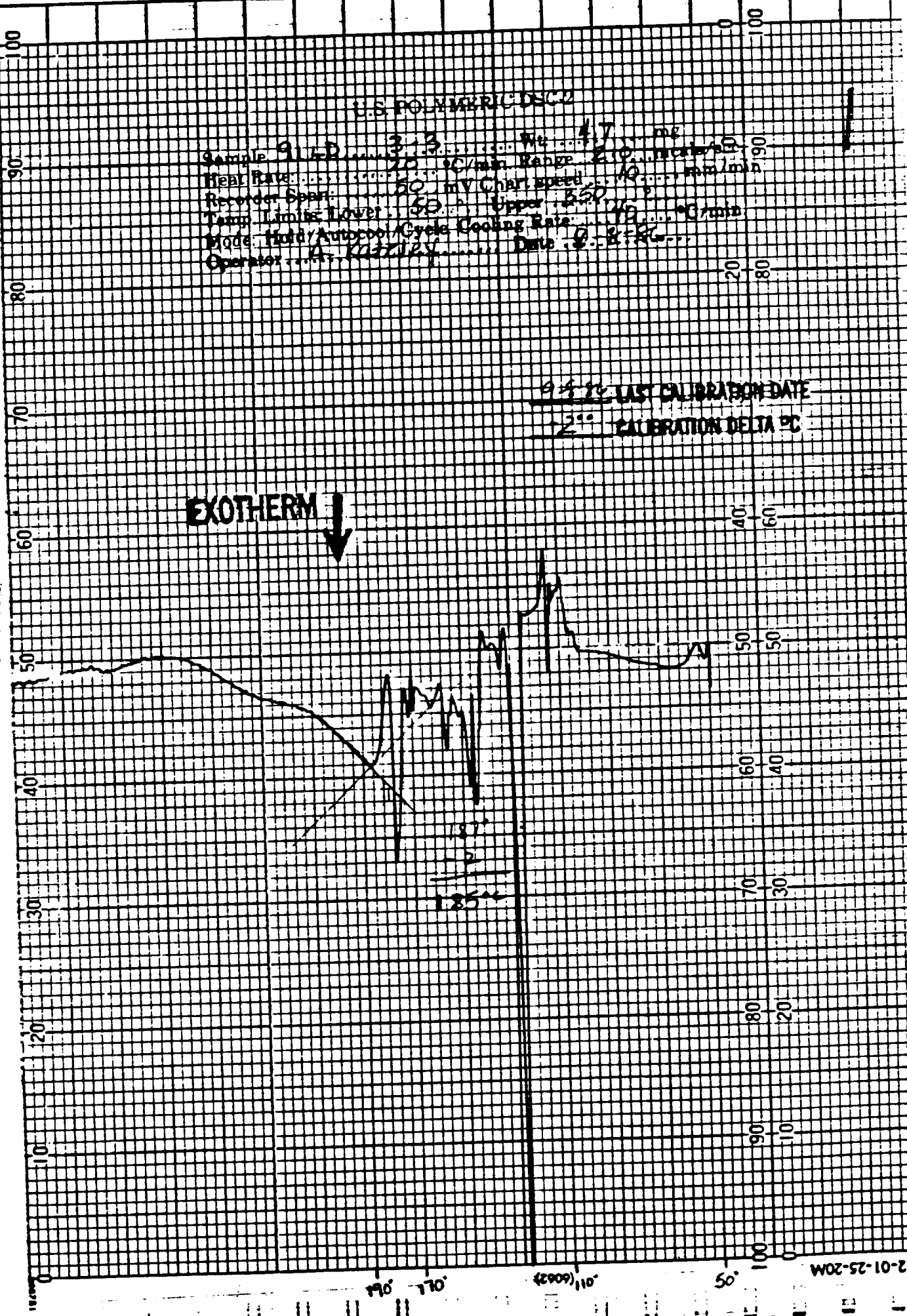
SOLEC

U.S. POLYMERICS DSC2

Sample 94-D-3-3 Wt. 4.7 mg
Heat Rate: 20 °C/min Range 2.0 mV/min
Recorder Span: 50 mV Chart speed 10 mm/min
Temp. Limits: Lower 50 Upper 350
Mode: Hold/Autocool/Cycle Cooling Rate 10 °C/min
Operator A. KATZ Date 9-8-86

9-8-86 LAST CALIBRATION DATE
2 °C CALIBRATION DELTA °C

EXOTHERM ↓



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DATA FILE A:PHEND36.HDR TAKEN 09-05-1986 15:49:05

***** AREA PERCENT REPORT *****

* Sample Name: 91LD,3-1,C=6.76 Operator Initials: JGZ *
* Date: 09-05-1986 15:49:05 Method:PHENOLIC DATA FILE: A:PHEND36.PTS *
* Interface: 4 Cycle#: 36 Channel#: 0 Vial#: N.A. *
* Starting Peak Width: 10 Threshold: .01 *
* Instrument Type: BECKMAN HPLC Column Type: MICROBONDAPAK C-18 *
* Solvent Description: THF/WATER, 2:1 BY WEIGHT *
* Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN *
* Detector 0: 220NM/.5AU Detector 1: *
* Misc. Information: LENGTH=25 *
** ***** Ending Retention Time: 10.00 *
Starting Delay: 0.00

Pk No.	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
1	1.80	118498	73.6309	2	5085	100.000	23.3
2	2.07	42437	26.3691	2	4223	35.813	10.1
Total Area:		160935	Area Reject:		1000	One sample per 1.000 sec.	

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OF POOR QUALITY

10.738 MV. HIGH SCALE=

LOW SCALE=

10.00 MIN. TO

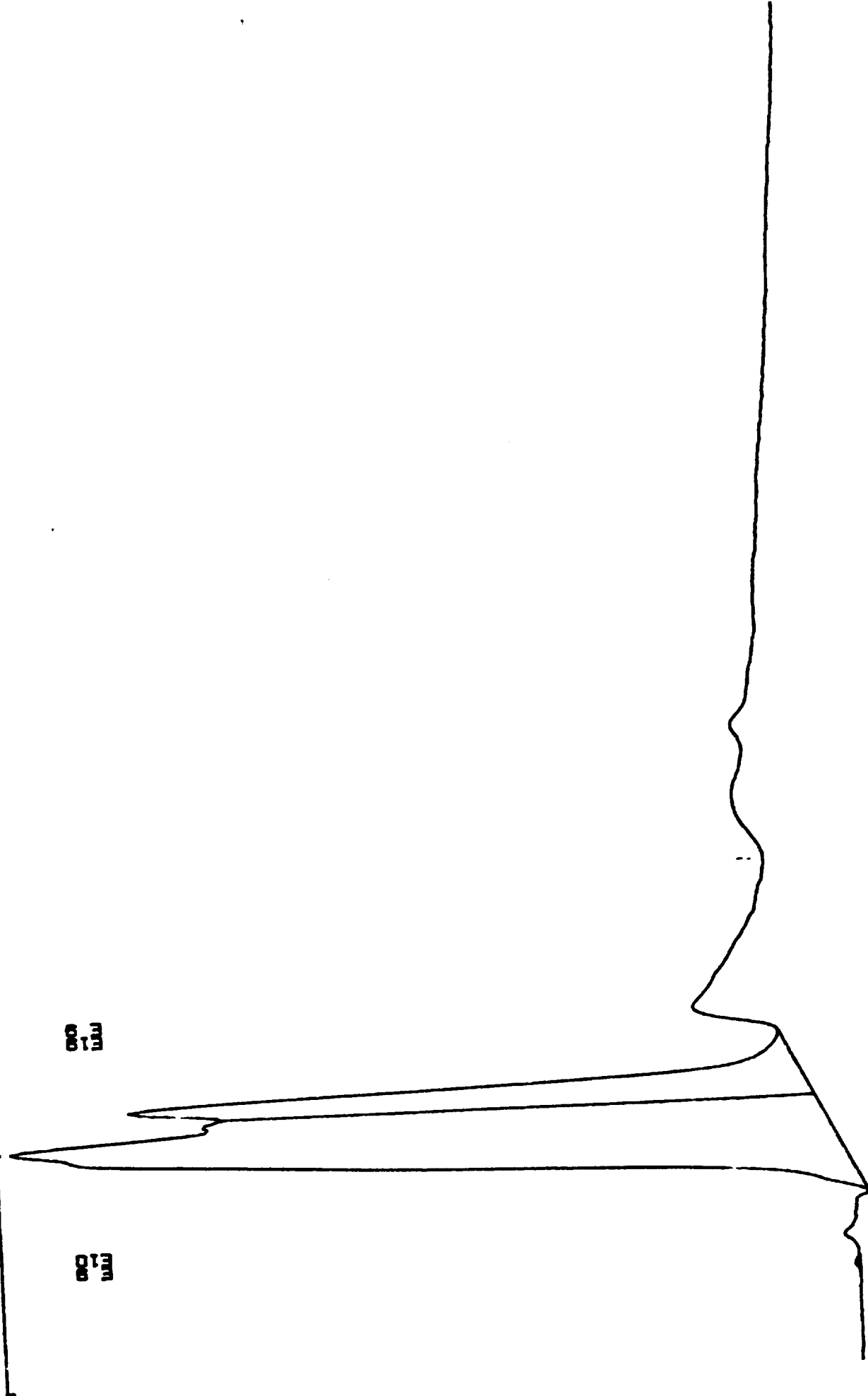
DATA FILE=PHEN038 FROM

81 LD. 3-1. C=8.76 MG/ML. 8/5/86. JGZ

1.80
2.07

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1111

00
T
1111



DATA FILE A:MB561.HDR TAKEN 09-05-1986 14:15:09
 DATA FILE A:PHEN035.HDR TAKEN 09-05-1986 15:28:08

***** AREA PERCENT REPORT *****

 * Sample Name: 91LD,3-2,C=6.99
 * Date: 09-05-1986 15:28:08 Method:PHENOLIC
 * Interface: 4 Cycle#: 35
 * Starting Peak Width: 10 Threshold: .01
 * *****
 * Instrument Type: BECKMAN HPLC Column Type: MICROBONDAPAK C-18
 * Solvent Description: THF/WATER, 2:1 BY WEIGHT
 * Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN
 * Detector 0: 220NM/.5AU Detector 1:
 * Misc. Information: LENGTH=25
 * *****
 * Starting Delay: 0.00 Ending Retention Time: 10.00

PK N.	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
2	1.78	117907	74.0922	2	5029	100.000	23.4
3	2.05	41228	25.9078	2	4167	34.967	9.9

Total Area: 159135 Area Reject: 1000 One sample per 1.000 sec.

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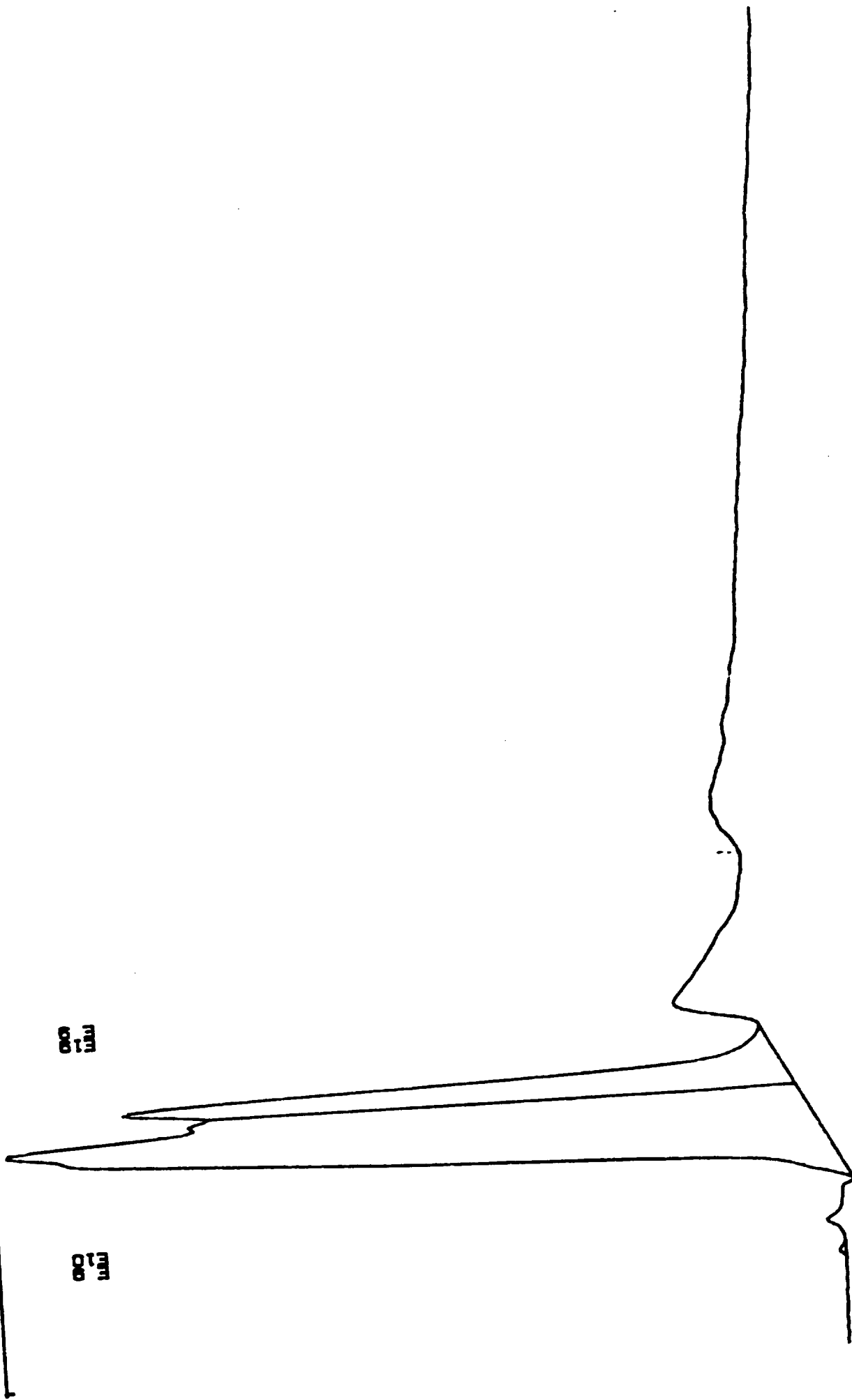
10.854 Mv.

5.378 Mv. HIGH SCALE=

DATA FILE-PHEN035 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE=

91 LD, 3-2, C-6.98 MG/ML, 9/5/86, JGZ

1.78 87.82



ATA FILE A:PHEND34.HDR TAKEN 09-05-1986 15:07:23

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***** AREA PERCENT REPORT *****

 Sample Name: 91LD,3-3,C=6.67 Operator Initials: JGZ *
 Date: 09-05-1986 15:07:23 Method:PHENDLIC DATA FILE: A:PHEND34.PTS *
 Interface: 4 Cycle#: 34 Channel#: 0 Vial#: N.A. *
 Starting Peak Width: 10 Threshold: .01 *
 Instrument Type: BECKMAN HPLC Column Type: MICROBONDAPAK C-18 *
 Solvent Description: THF/WATER, 2:1 BY WEIGHT *
 Operating Conditions: R.T., FLOWRATE=1.5 ML/MIN *
 Detector 0: 220NM/.5AU Detector 1: *
 Misc. Information: LENGTH=25 *
 Starting Delay: 0.00 Ending Retention Time: 10.00 *

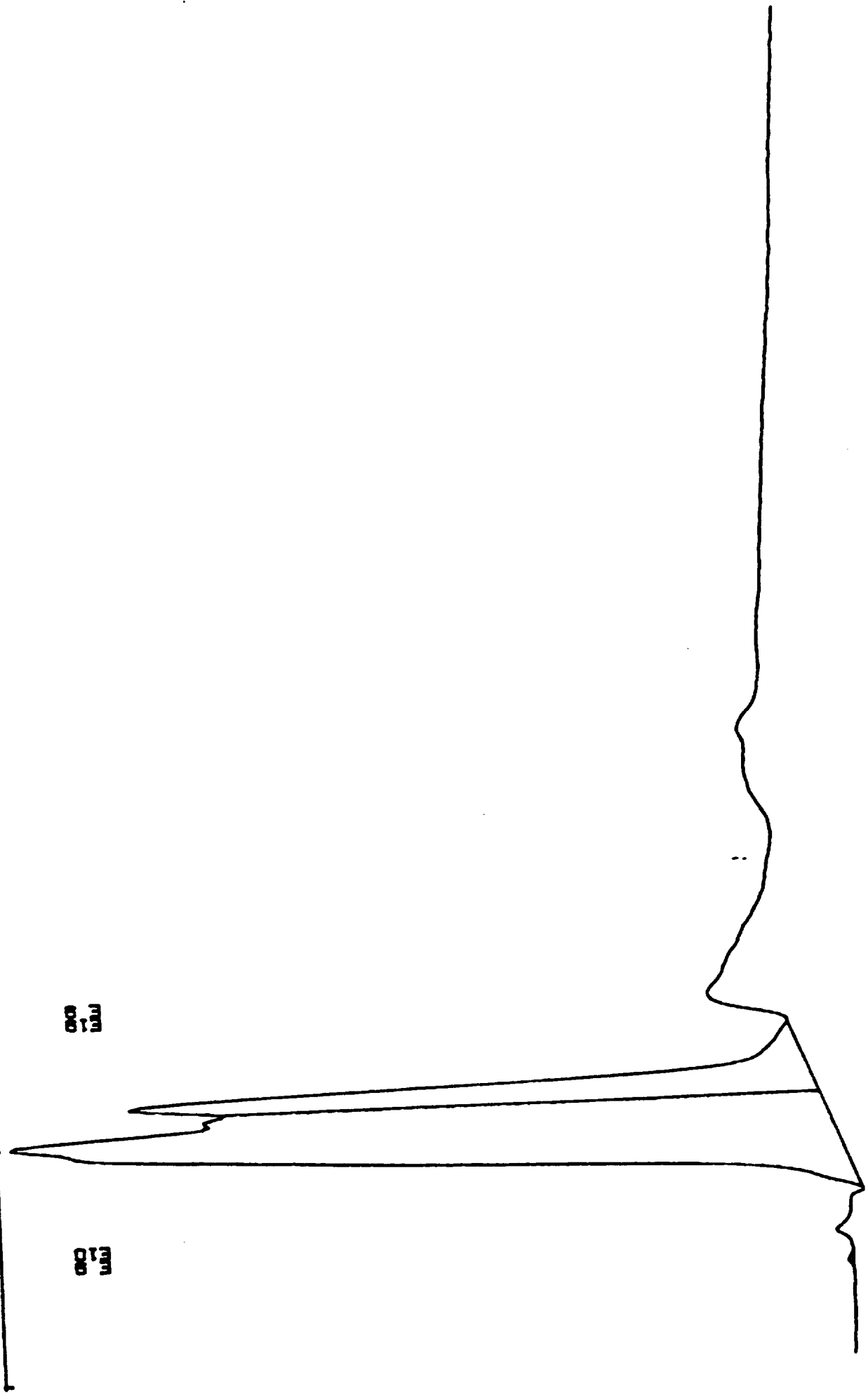
PK No	Ret Time	Peak Area	Area %	B L	Peak Ht.	Normalized %	Area/ Height
3	1.78	118569	73.0817	2	5139	100.000	23.1
1	2.05	43673	26.9184	2	4294	36.833	10.2
Total Area:		162242	Area Reject:		1000 One sample per 1.000 sec.		

DATA FILE=PHEN034 FROM 0.00 MIN. TO 10.00 MIN. LOW SCALE= 5.410 MV. HIGH SCALE= 10.735 MV.
91 LD, 3-3, C=6.67 MG/ML, 9/5/86. JGZ

1.78
2.05

000
1.00

000
1.00



GPC CALIBRATION PLOT

*** Calibration Data ***

Calibration Name:
Misc Information:

Fit Type: 3

Log Mol Wt = $A + Bx + Cx^2 + Dx^3$

A = 2.538977

B = 2.115815 C = -.5646824

D = 3.606432E-02

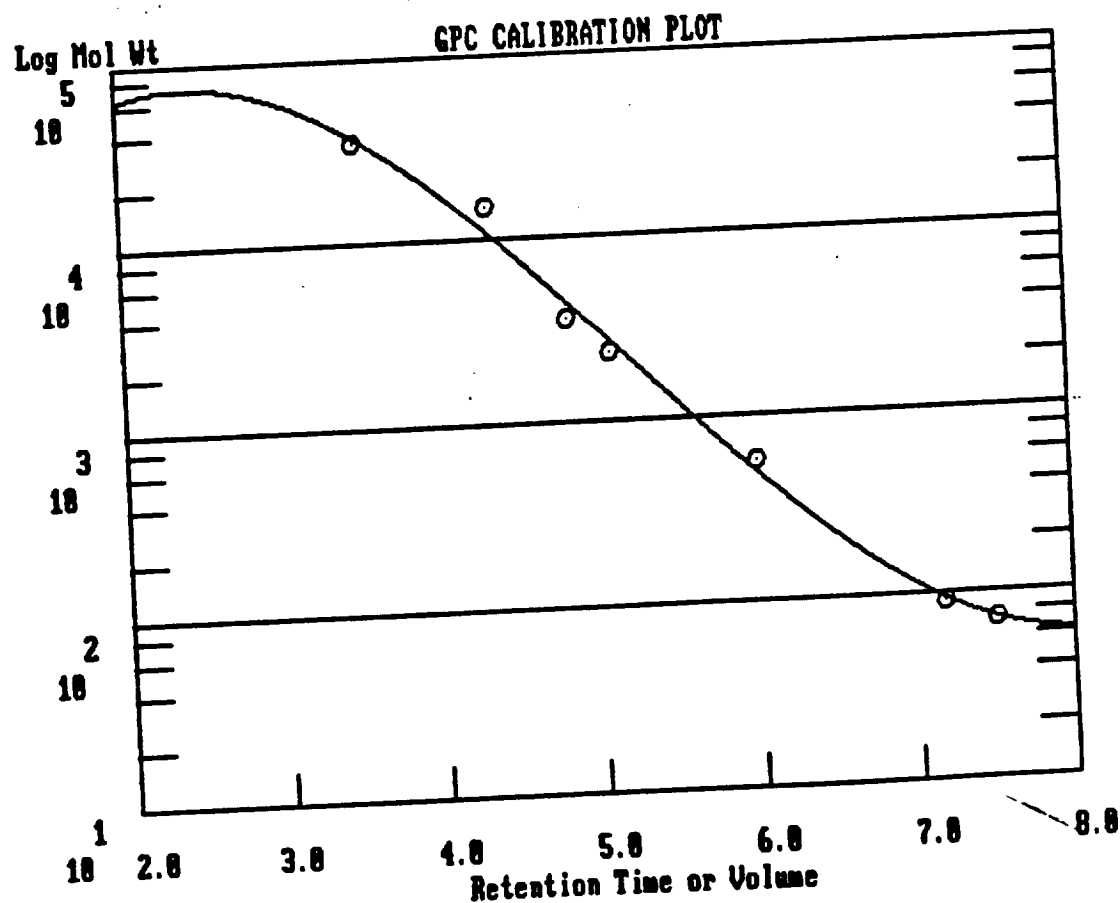
Coefficient of Determination: 0.9902

Ret Time

Molecular Weight

Log Mol Wt

3.50	35000	4.544
4.33	15000	4.176
4.83	3600	3.556
5.09	2350	3.371
6.00	570	2.756
7.17	92	1.964
7.50	72	1.857



AT FILE B:GPC21 .HDR TAKEN 08-05-1986 17:26:22

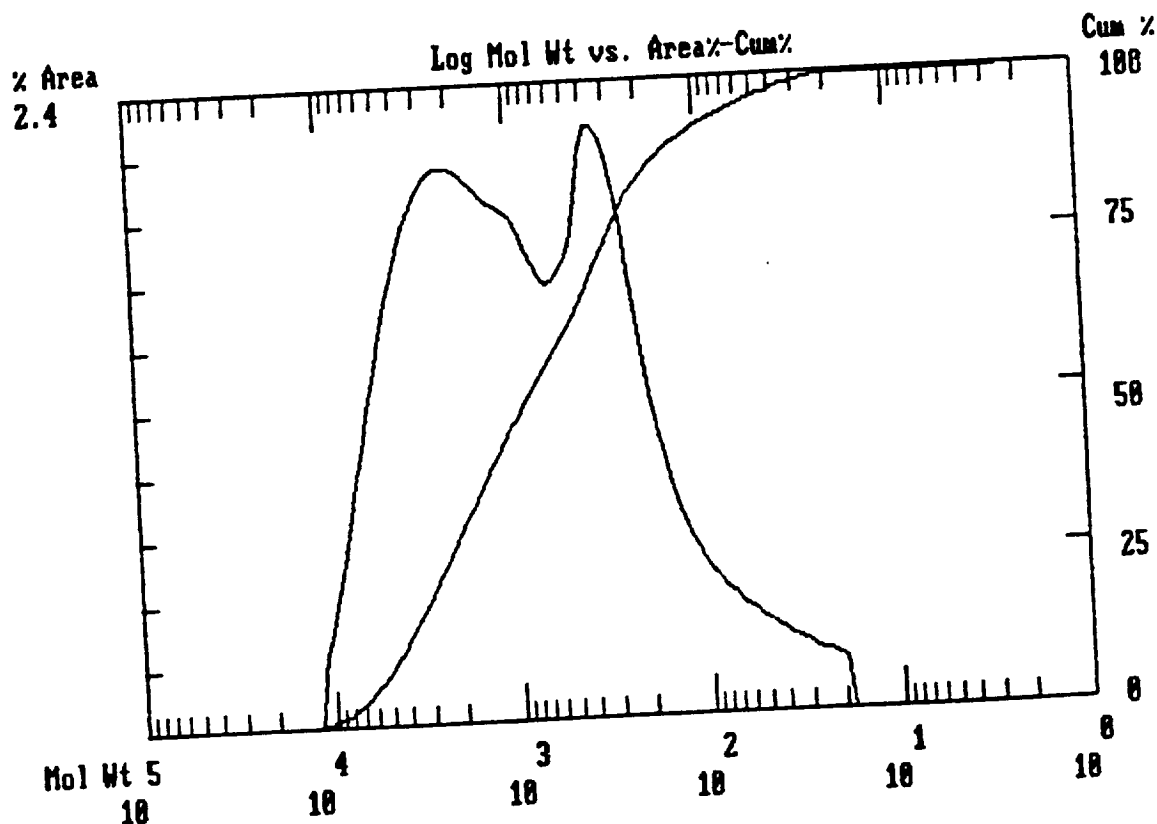
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***** GPC REPORT *****

```

*****
* Sample Name: 91LD 3-1 C=2.68                      Operator Initials: GBF
* Date: 08-05-1986 11:42:15 Method:                 DATA FILE: B:GPC21 .PTS
* Interface: 5 Cycle#: 21                           Channel#: 0 Vial#: N.A.
* Starting Peak Width: 60 Threshold: 0
*****
* Instrument Type: HPLC/BECKMAN                      Column Type: ULTRASTYRAGEL 500A
* Solvent Description: THF
* Operating Conditions: T=35C FLOWRATE=2.0ML/MIN
* Detector 0: 254NM/.1AU Detector 1:
* Misc. Information: CALIBRATION/GPC
*****
* Starting Delay: 0.00                               Ending Retention Time: 10.00
* Calibration file: GPCPHEN
* Molecular Weight Distribution Averages
* Baseline TIMES: 3.85 to 10.00 MW: 22295 to 2
* Process TIMES: 3.85 to 10.00 MW: 22295 to 2
* Total Area: 256218
* Mw= 1666
* Mn= 284
* Mv= 5.8652
* Mw/Mn= 4056
* Mw/Mv= 1451

```



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A FILE B:GPC23 .HDR TAKEN 08-05-1986 17:31:38

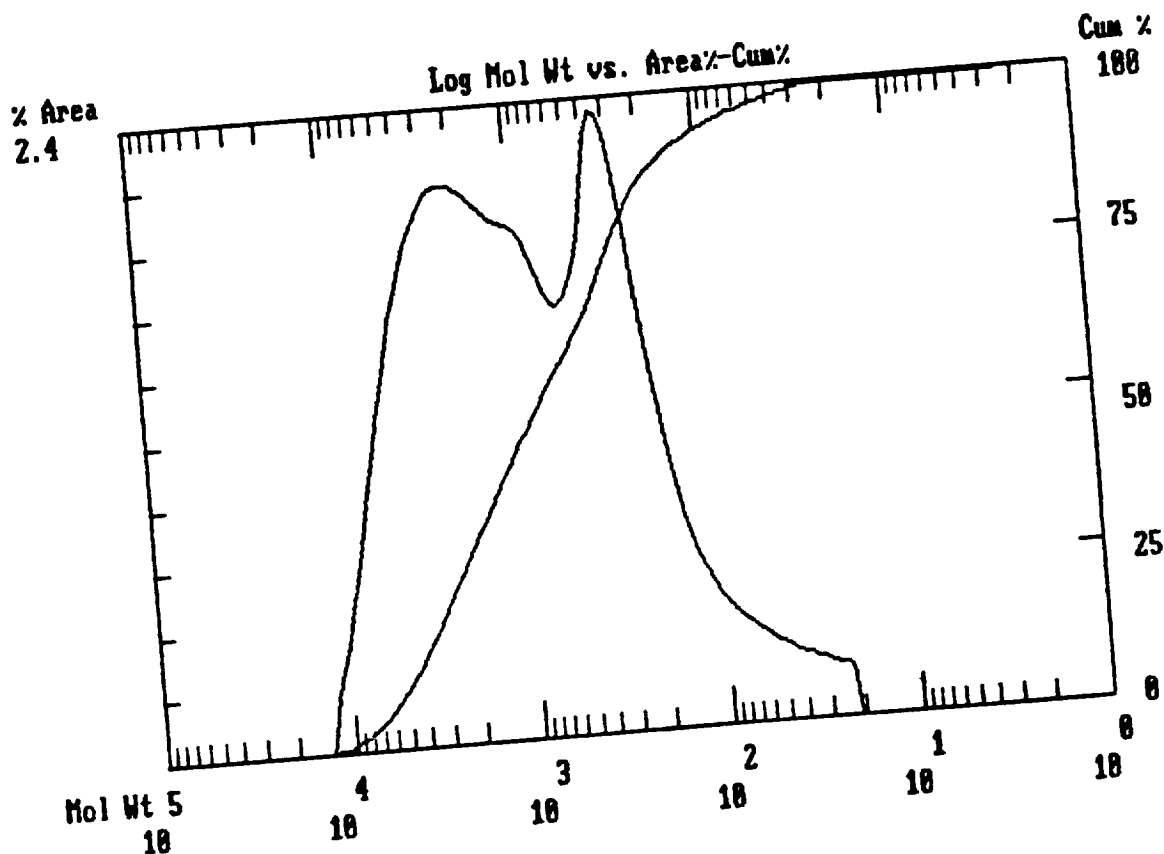
***** GPC REPORT *****

 Sample Name: 91LD 3-2 C=2.68
 Date: 08-05-1986 12:14:53 Method:
 Interface: 5 Cycle#: 23
 Starting Peak Width: 60 Threshold: 0

 Instrument Type: HPLC/BECKMAN
 Solvent Description: THF
 Operating Conditions: T=35C FLOWRATE=2.0ML/MIN
 Detector 0: 254NM/.1AU
 Misc. Information: CALIBRATION/GPC

 Starting Delay: 0.00
 Calibration file: GPCPHEN
 Molecular Weight Distribution Averages
 Baseline TIMES: 3.85 to 10.00 MW: 22295 to 2
 Process TIMES: 3.85 to 10.00 MW: 22295 to 2
 Total Area: 251238
 = 1751
 = 322
 = 5.4277
 w/Mn= 4258
 = 1527
 =

 Column Type: ULTRASTYRAGEL 500A
 Detector 1:
 Ending Retention Time: 10.00



FILE B+GPC24 .HDR TAKEN 08-05-1986 17:34:48

***** GPC REPORT *****

```

*****
* ***** Operator Initials: GBF *****
* Sample Name: 91LD 3-3 C=2.68 DATA FILE: B:GPC24 .PTS
* Date: 08-05-1986 12:29:38 Method: Channel#: 0 Vial#: N.A.
* Interface: 5 Cycle#: 24
* Starting Peak Width: 60 Threshold: 0
* *****
* Instrument Type: HPLC/BECKMAN Column Type: ULTRASTYRAGEL 500A
* Solvent Description: THF
* Operating Conditions: T=35C FLOWRATE=2.0ML/MIN
* Detector 0: 254NM/.1AU Detector 1:
* Misc. Information: CALIBRATION/GPC
* *****

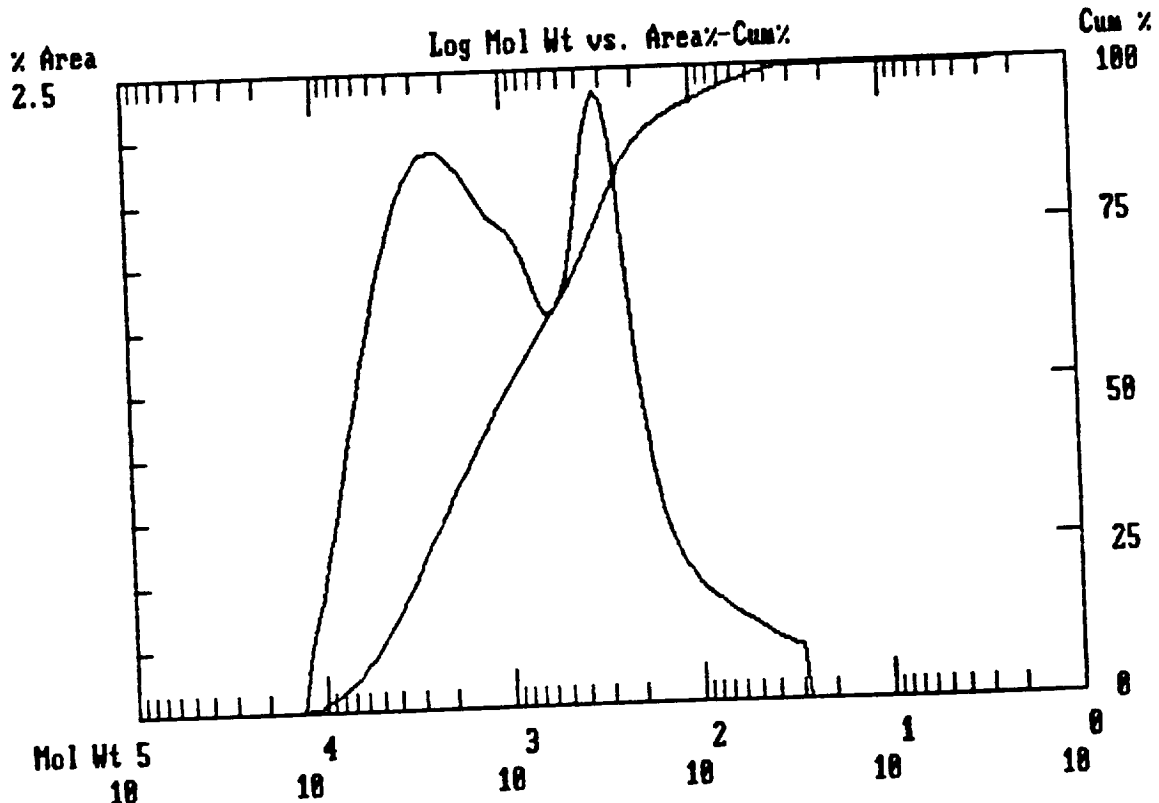
```

***** Ending Retention Time: 10.00
Starting Delay: 0.00

```

Starting Delay:
 ibration file: GPCPHEN
Molecular Weight Distribution Averages
Baseline TIMES:      3.85 to      10.00      MW:      22295 to
Process TIMES:      3.85 to      10.00      MW:      22295 to
Total Area:      243393
1w=      1838
1n=      369
1 Mn=      4.9751
1z=      4370
1v=      1608

```



NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT3-1

1.0E3

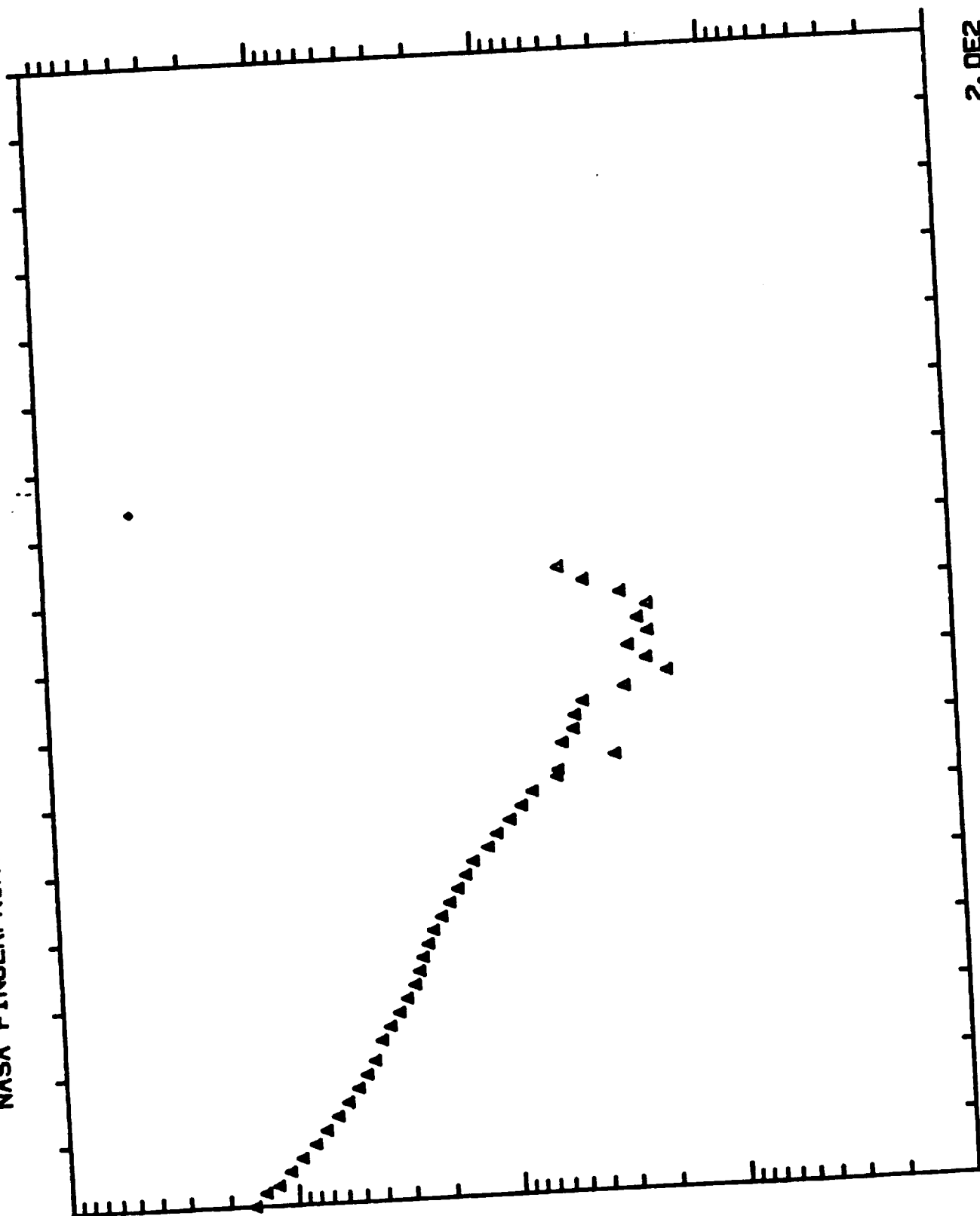
ETA* POISE (A)

1.0E-1

2.0E2

TEMP DEG. C

3.0E1



Rheometrics RECAP II

Experiment No. : 15 Sample No. : 1

Title: A FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA 1013-1

Operator : CP

End Time : Wednesday, August 20, 1986 - 10:16:33

Operating Mode : DYNAMIC

Heep Type : CURE

Geometry : DISK & PLATE

RADIUS : 25.00

GAP : 0.50

Notes :

TRAIN = 50%

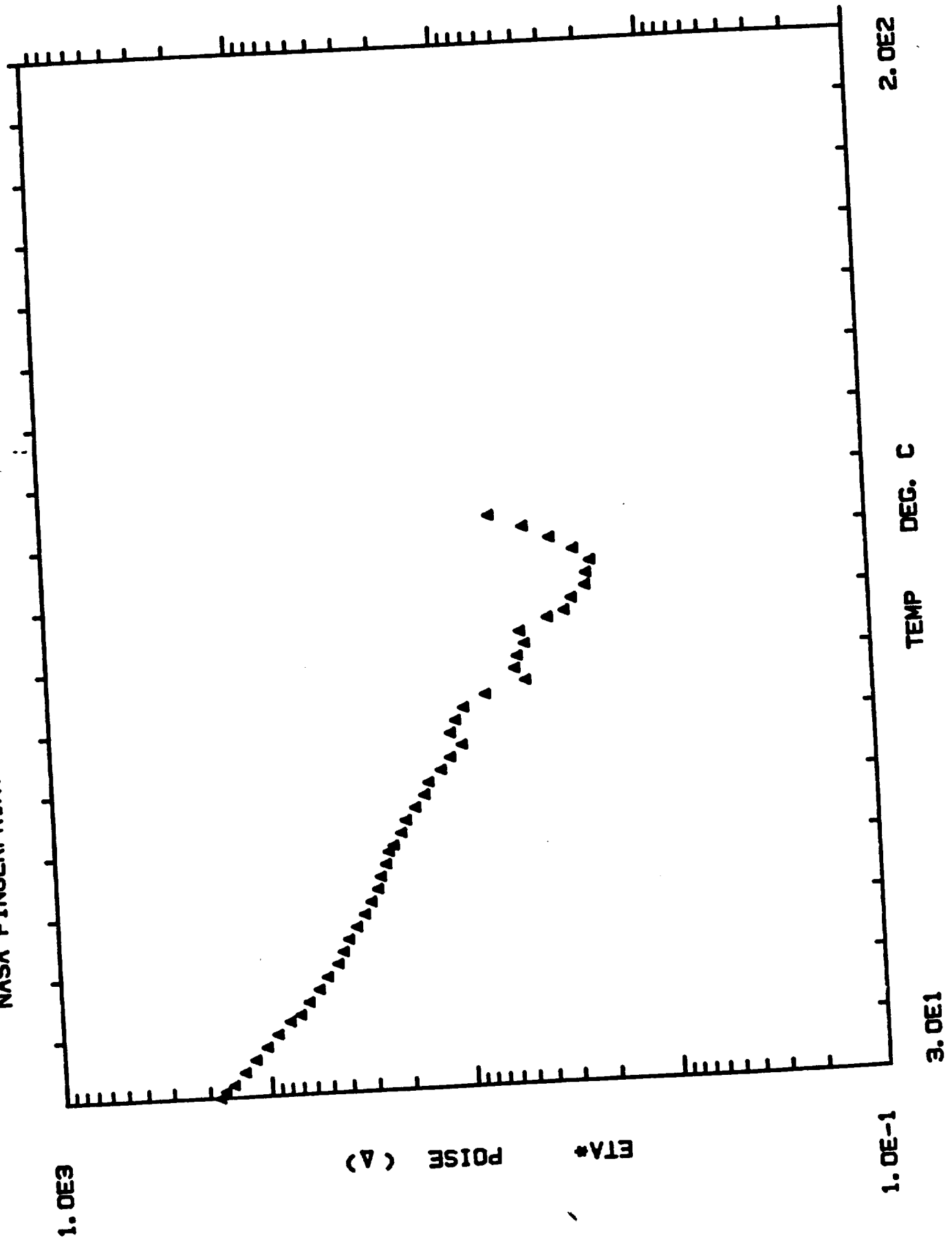
FREQUENCY = 10RAD/SEC

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	ETA*	ETA'	ETA"	TORQUE	TIME	TEMP
	POISE	POISE	POISE	GRAMS-CM	MIN.	DEG. C
	1.807e+002	1.753e+002	4.413e+001	2.264e+001	2.000e-001	2.700e+001
2	1.686e+002	1.639e+002	3.980e+001	2.113e+001	1.000e+000	2.800e+001
3	1.529e+002	1.483e+002	3.713e+001	1.914e+001	2.000e+000	3.000e+001
4	1.359e+002	1.312e+002	3.551e+001	1.703e+001	3.000e+000	3.200e+001
5	1.190e+002	1.141e+002	3.386e+001	1.491e+001	4.000e+000	3.300e+001
6	1.048e+002	9.925e+001	3.352e+001	1.312e+001	5.000e+000	3.500e+001
7	9.230e+001	8.629e+001	3.275e+001	1.157e+001	6.000e+000	3.700e+001
8	8.016e+001	7.380e+001	3.130e+001	1.004e+001	7.000e+000	3.900e+001
9	7.122e+001	6.450e+001	3.020e+001	8.925e+000	8.000e+000	4.100e+001
10	6.291e+001	5.591e+001	2.886e+001	7.886e+000	9.000e+000	4.300e+001
11	5.630e+001	4.901e+001	2.771e+001	7.050e+000	1.000e+001	4.500e+001
12	5.041e+001	4.273e+001	2.675e+001	6.322e+000	1.100e+001	4.700e+001
13	4.588e+001	3.772e+001	2.612e+001	5.749e+000	1.200e+001	4.900e+001
14	4.195e+001	3.351e+001	2.524e+001	5.259e+000	1.300e+001	5.100e+001
15	3.873e+001	2.998e+001	2.453e+001	4.851e+000	1.400e+001	5.400e+001
16	3.532e+001	2.682e+001	2.299e+001	4.427e+000	1.500e+001	5.600e+001
17	3.208e+001	2.447e+001	2.075e+001	4.018e+000	1.600e+001	5.800e+001
18	2.935e+001	2.238e+001	1.898e+001	3.678e+000	1.700e+001	6.000e+001
19	2.697e+001	2.103e+001	1.689e+001	3.377e+000	1.800e+001	6.200e+001
20	2.559e+001	2.033e+001	1.554e+001	3.206e+000	1.900e+001	6.400e+001
21	2.449e+001	1.996e+001	1.420e+001	3.066e+000	2.000e+001	6.600e+001
22	2.308e+001	1.940e+001	1.250e+001	2.892e+000	2.100e+001	6.800e+001
23	2.176e+001	1.895e+001	1.070e+001	2.725e+000	2.200e+001	7.000e+001
24	1.990e+001	1.809e+001	8.286e+000	2.495e+000	2.300e+001	7.200e+001
25	1.822e+001	1.684e+001	6.946e+000	2.282e+000	2.400e+001	7.400e+001
26	1.667e+001	1.564e+001	5.770e+000	2.090e+000	2.500e+001	7.600e+001
27	1.525e+001	1.438e+001	5.067e+000	1.912e+000	2.600e+001	7.800e+001
28	1.407e+001	1.344e+001	4.138e+000	1.765e+000	2.700e+001	8.000e+001
29	1.203e+001	1.150e+001	3.531e+000	1.510e+000	2.800e+001	8.200e+001
30	1.090e+001	1.050e+001	2.956e+000	1.368e+000	2.900e+001	8.400e+001
31	9.522e+000	9.150e+000	2.635e+000	1.195e+000	3.000e+001	8.600e+001
32	8.399e+000	8.037e+000	2.438e+000	1.053e+000	3.100e+001	8.800e+001
33	7.470e+000	7.220e+000	1.916e+000	9.374e-001	3.200e+001	9.000e+001
34	5.769e+000	5.583e+000	1.451e+000	7.239e-001	3.300e+001	9.200e+001
35	5.678e+000	5.498e+000	1.418e+000	7.128e-001	3.400e+001	9.300e+001
36	3.158e+000	3.134e+000	3.857e-001	3.962e-001	3.500e+001	9.500e+001
37	5.398e+000	5.333e+000	8.347e-001	6.773e-001	3.600e+001	9.700e+001
38	4.775e+000	4.669e+000	9.992e-001	5.985e-001	3.700e+001	9.900e+001
39	4.679e+000	4.642e+000	5.860e-001	5.865e-001	3.800e+001	1.010e+002
40	4.276e+000	4.182e+000	8.925e-001	5.366e-001	3.900e+001	1.030e+002
41	2.767e+000	2.754e+000	2.753e-001	3.472e-001	4.000e+001	1.050e+002
42	1.787e+000	1.631e+000	7.296e-001	2.244e-001	4.100e+001	1.070e+002
43	2.198e+000	2.135e+000	5.214e-001	2.759e-001	4.200e+001	1.090e+002
44	2.635e+000	2.620e+000	2.782e-001	3.309e-001	4.300e+001	1.110e+002
45	2.138e+000	2.138e+000	5.196e-002	2.683e-001	4.400e+001	1.130e+002
46	2.367e+000	2.254e+000	7.212e-001	2.970e-001	4.500e+001	1.150e+002
47	2.131e+000	2.032e+000	6.398e-001	2.675e-001	4.600e+001	1.170e+002
48	2.789e+000	2.539e+000	1.154e+000	3.499e-001	4.700e+001	1.190e+002
49	4.053e+000	3.849e+000	1.271e+000	5.086e-001	4.800e+001	1.210e+002
50	5.206e+000	4.692e+000	2.255e+000	6.526e-001	4.900e+001	1.230e+002

ORIGINAL PAGE IS
OF POOR QUALITY

NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT3-2



Rheometrics RECAP II

Experiment No. : 16 Sample No. : 1

FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT3-2

Operator : CP

Date and Time : Wednesday, August 20, 1986 11:46:31

Operating Mode : DYNAMIC

Test Type : CURE

Geometry : DISK & PLATE

RADIUS : 25.00

GAP : 0.50

Strain : 50%

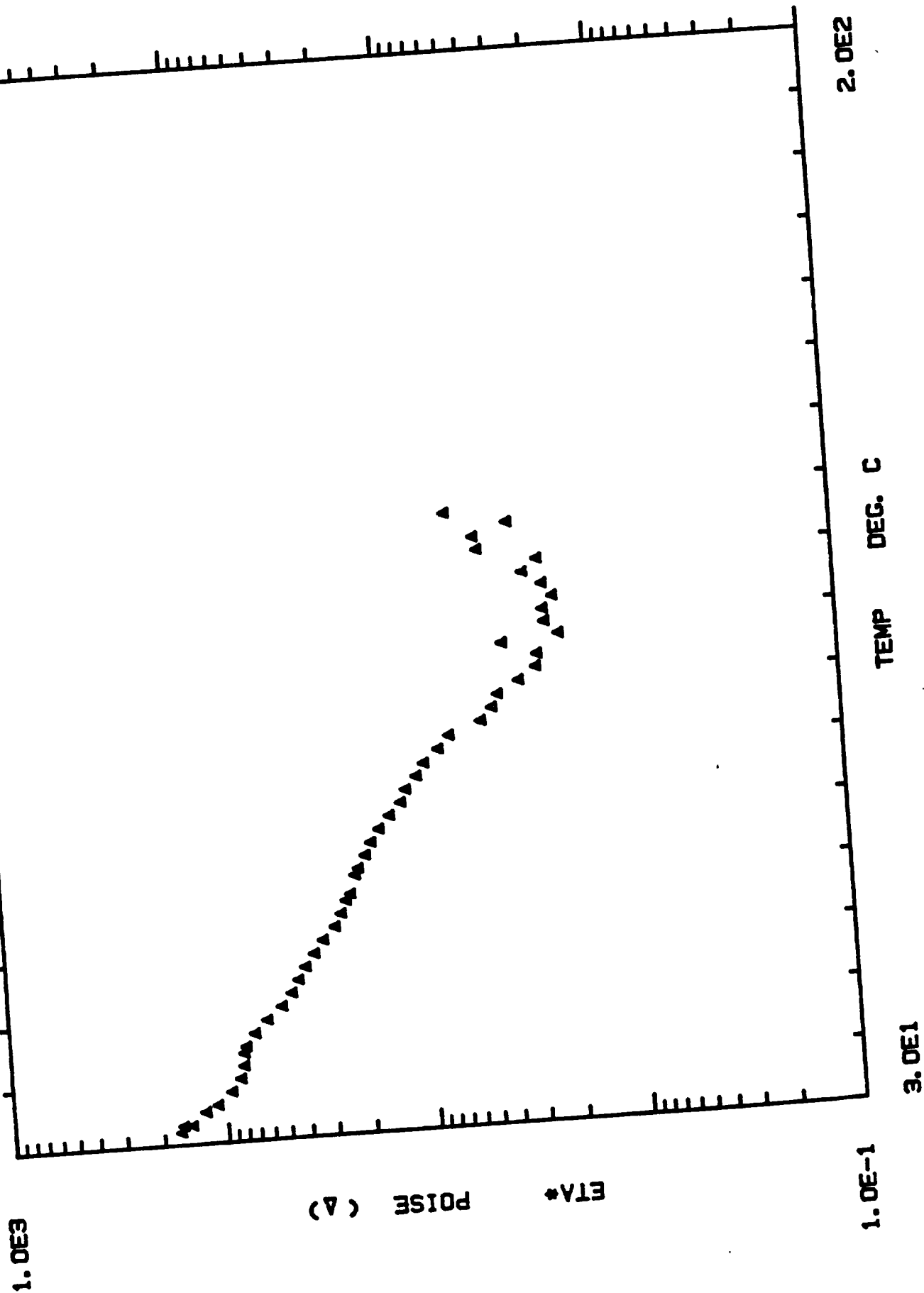
Frequency : 10RAD/SEC

ORIGINAL PAGE IS
OF POOR QUALITY

ID.	ETA*	ETA'	ETA''	TORQUE	TIME	TEMP
	POISE	POISE	POISE	GRAMS-CM	MIN.	DEG. C
1	1.750e+002	1.698e+002	4.214e+001	2.197e+001	2.000e-001	3.000e+001
2	1.643e+002	1.595e+002	3.929e+001	2.063e+001	1.000e+000	3.100e+001
3	1.486e+002	1.439e+002	3.709e+001	1.864e+001	2.000e+000	3.200e+001
4	1.307e+002	1.261e+002	3.441e+001	1.639e+001	3.000e+000	3.400e+001
5	1.152e+002	1.101e+002	3.403e+001	1.447e+001	4.000e+000	3.600e+001
6	1.008e+002	9.513e+001	3.343e+001	1.264e+001	5.000e+000	3.800e+001
7	8.867e+001	8.240e+001	3.277e+001	1.113e+001	6.000e+000	4.000e+001
8	7.711e+001	7.047e+001	3.130e+001	9.671e+000	7.000e+000	4.200e+001
9	6.630e+001	6.112e+001	3.048e+001	8.565e+000	8.000e+000	4.300e+001
10	6.164e+001	5.408e+001	2.958e+001	7.734e+000	9.000e+000	4.500e+001
11	5.460e+001	4.642e+001	2.875e+001	6.846e+000	1.000e+001	4.700e+001
12	4.943e+001	4.103e+001	2.755e+001	6.199e+000	1.100e+001	4.900e+001
13	4.357e+001	3.486e+001	2.613e+001	5.462e+000	1.200e+001	5.100e+001
14	4.084e+001	3.195e+001	2.543e+001	5.120e+000	1.300e+001	5.300e+001
15	3.825e+001	2.922e+001	2.468e+001	4.795e+000	1.400e+001	5.500e+001
16	3.460e+001	2.609e+001	2.272e+001	4.340e+000	1.500e+001	5.700e+001
17	3.154e+001	2.377e+001	2.072e+001	3.951e+000	1.600e+001	5.900e+001
18	2.914e+001	2.206e+001	1.904e+001	3.651e+000	1.700e+001	6.100e+001
19	2.687e+001	2.077e+001	1.705e+001	3.369e+000	1.800e+001	6.300e+001
20	2.587e+001	2.040e+001	1.591e+001	3.241e+000	1.900e+001	6.500e+001
21	2.422e+001	1.963e+001	1.419e+001	3.037e+000	2.000e+001	6.700e+001
22	2.338e+001	1.943e+001	1.300e+001	2.930e+000	2.100e+001	6.900e+001
23	2.207e+001	1.895e+001	1.130e+001	2.767e+000	2.200e+001	7.000e+001
24	2.007e+001	1.755e+001	9.736e+000	2.515e+000	2.300e+001	7.200e+001
25	1.897e+001	1.690e+001	8.606e+000	2.380e+000	2.400e+001	7.400e+001
26	1.696e+001	1.557e+001	6.724e+000	2.127e+000	2.500e+001	7.600e+001
27	1.521e+001	1.426e+001	5.293e+000	1.910e+000	2.600e+001	7.800e+001
28	1.444e+001	1.344e+001	5.284e+000	1.812e+000	2.700e+001	8.000e+001
29	1.248e+001	1.173e+001	4.278e+000	1.567e+000	2.800e+001	8.200e+001
30	1.118e+001	1.063e+001	3.477e+000	1.404e+000	2.900e+001	8.400e+001
31	9.738e+000	9.302e+000	2.879e+000	1.222e+000	3.000e+001	8.600e+001
32	1.107e+001	1.070e+001	2.823e+000	1.390e+000	3.100e+001	8.800e+001
33	1.038e+001	9.901e+000	3.117e+000	1.302e+000	3.200e+001	9.000e+001
34	9.424e+000	9.087e+000	2.495e+000	1.183e+000	3.300e+001	9.200e+001
35	7.320e+000	7.208e+000	1.276e+000	9.191e-001	3.400e+001	9.400e+001
36	4.630e+000	4.559e+000	8.080e-001	5.807e-001	3.500e+001	9.600e+001
37	5.220e+000	5.203e+000	4.206e-001	6.553e-001	3.600e+001	9.800e+001
38	5.032e+000	4.930e+000	1.008e+000	6.311e-001	3.700e+001	1.000e+002
39	4.606e+000	4.484e+000	1.052e+000	5.779e-001	3.800e+001	1.020e+002
40	4.843e+000	4.770e+000	8.349e-001	6.074e-001	3.900e+001	1.040e+002
41	3.510e+000	3.502e+000	2.337e-001	4.402e-001	4.000e+001	1.060e+002
42	2.902e+000	2.853e+000	5.302e-001	3.638e-001	4.100e+001	1.070e+002
43	2.663e+000	2.543e+000	7.924e-001	3.339e-001	4.200e+001	1.090e+002
44	2.271e+000	2.147e+000	7.413e-001	2.845e-001	4.300e+001	1.110e+002
45	2.235e+000	1.835e+000	1.276e+000	2.801e-001	4.400e+001	1.130e+002
46	2.124e+000	1.383e+000	1.612e+000	2.659e-001	4.500e+001	1.150e+002
47	2.549e+000	2.370e+000	9.395e-001	3.196e-001	4.600e+001	1.170e+002
48	3.300e+000	2.833e+000	1.691e+000	4.142e-001	4.700e+001	1.190e+002
49	4.442e+000	3.945e+000	2.042e+000	5.573e-001	4.800e+001	1.210e+002
50	6.473e+000	6.061e+000	2.272e+000	8.129e-001	4.900e+001	1.230e+002

ORIGINAL PAGE IS
OF POOR QUALITY

NASA FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT3-3



Rheometrics RECAP II

Experiment No. : 17 Sample No. : 1

le: FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOT3-3

Motor : CP

Date and Time : Wednesday, August 20, 1986 13:21:49

Operating Mode : DYNAMIC

Test Type : CURE

Geometry : DISK & PLATE
RADIUS : 25.00
GAP : 0.50

Strain :
RAIN = 50%
FREQUENCY = 10 RAD/SEC

ORIGINAL PAGE IS
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FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA 1413-3

	ETA*	ETA'	ETA"	TORQUE	TIME	TEMP
	POISE	POISE	POISE	GRAMS-CM	MIN.	DEG. C
	1.618e+002	1.588e+002	3.110e+001	2.033e+001	2.000e-001	3.300e+001
	1.672e+002	1.637e+002	3.380e+001	2.100e+001	1.000e+000	3.200e+001
	1.478e+002	1.458e+002	2.440e+001	1.857e+001	2.000e+000	3.300e+001
	1.265e+002	1.252e+002	1.824e+001	1.588e+001	3.000e+000	3.500e+001
	1.105e+002	1.093e+002	1.647e+001	1.387e+001	4.000e+000	3.600e+001
	9.431e+001	9.323e+001	1.425e+001	1.184e+001	5.000e+000	3.800e+001
	8.468e+001	8.322e+001	1.579e+001	1.064e+001	6.000e+000	4.000e+001
	8.108e+001	7.853e+001	2.018e+001	1.018e+001	7.000e+000	4.200e+001
	8.018e+001	7.575e+001	2.628e+001	1.007e+001	8.000e+000	4.400e+001
	7.819e+001	7.228e+001	2.982e+001	9.816e+000	9.000e+000	4.500e+001
	7.045e+001	6.338e+001	3.078e+001	8.848e+000	1.000e+001	4.700e+001
	6.104e+001	5.332e+001	2.971e+001	7.662e+000	1.100e+001	4.900e+001
	5.157e+001	4.361e+001	2.754e+001	6.478e+000	1.200e+001	5.100e+001
	4.594e+001	3.814e+001	2.560e+001	5.765e+000	1.300e+001	5.300e+001
	4.231e+001	3.447e+001	2.452e+001	5.313e+000	1.400e+001	5.500e+001
	3.889e+001	3.108e+001	2.337e+001	4.881e+000	1.500e+001	5.700e+001
	3.506e+001	2.743e+001	2.184e+001	4.402e+000	1.600e+001	5.900e+001
	3.154e+001	2.471e+001	1.959e+001	3.962e+000	1.700e+001	6.100e+001
	2.753e+001	2.178e+001	1.684e+001	3.456e+000	1.800e+001	6.300e+001
	2.550e+001	2.072e+001	1.486e+001	3.202e+000	1.900e+001	6.500e+001
	2.394e+001	1.982e+001	1.343e+001	3.004e+000	2.000e+001	6.700e+001
	2.274e+001	1.967e+001	1.140e+001	2.854e+000	2.100e+001	6.800e+001
	2.140e+001	1.848e+001	1.078e+001	2.685e+000	2.200e+001	7.100e+001
	2.057e+001	1.829e+001	9.422e+000	2.582e+000	2.300e+001	7.200e+001
	1.891e+001	1.726e+001	7.724e+000	2.376e+000	2.400e+001	7.400e+001
	1.763e+001	1.628e+001	6.775e+000	2.214e+000	2.500e+001	7.600e+001
	1.601e+001	1.509e+001	5.365e+000	2.012e+000	2.600e+001	7.800e+001
	1.417e+001	1.331e+001	4.871e+000	1.779e+000	2.700e+001	8.000e+001
	1.245e+001	1.186e+001	3.806e+000	1.564e+000	2.800e+001	8.200e+001
	1.168e+001	1.117e+001	3.399e+000	1.465e+000	2.900e+001	8.400e+001
	1.032e+001	9.922e+000	2.823e+000	1.296e+000	3.000e+001	8.600e+001
	9.434e+000	9.276e+000	1.721e+000	1.186e+000	3.100e+001	8.800e+001
	7.995e+000	7.814e+000	1.691e+000	1.005e+000	3.200e+001	9.000e+001
	7.045e+000	6.916e+000	1.343e+000	8.844e-001	3.300e+001	9.200e+001
	4.942e+000	4.887e+000	7.392e-001	6.199e-001	3.400e+001	9.400e+001
	4.341e+000	4.251e+000	8.808e-001	5.449e-001	3.500e+001	9.600e+001
	4.037e+000	3.885e+000	1.096e+000	5.067e-001	3.600e+001	9.800e+001
	3.181e+000	3.043e+000	9.275e-001	3.996e-001	3.700e+001	1.000e+002
	2.623e+000	2.571e+000	5.188e-001	3.294e-001	3.800e+001	1.020e+002
	2.561e+000	2.467e+000	6.893e-001	3.219e-001	3.900e+001	1.040e+002
	3.734e+000	3.647e+000	8.011e-001	4.688e-001	4.000e+001	1.060e+002
	2.005e+000	1.778e+000	9.256e-001	2.518e-001	4.100e+001	1.070e+002
	2.323e+000	2.209e+000	7.162e-001	2.921e-001	4.200e+001	1.090e+002
	2.343e+000	2.251e+000	6.491e-001	2.945e-001	4.300e+001	1.110e+002
	2.096e+000	1.745e+000	1.162e+000	2.636e-001	4.400e+001	1.130e+002
	2.325e+000	2.206e+000	7.362e-001	2.922e-001	4.500e+001	1.150e+002
	2.853e+000	2.674e+000	9.930e-001	3.586e-001	4.600e+001	1.170e+002
	2.416e+000	2.105e+000	1.185e+000	3.035e-001	4.700e+001	1.190e+002
	4.607e+000	4.346e+000	1.530e+000	5.792e-001	4.800e+001	1.210e+002
	4.769e+000	4.631e+000	1.139e+000	5.993e-001	4.900e+001	1.230e+002

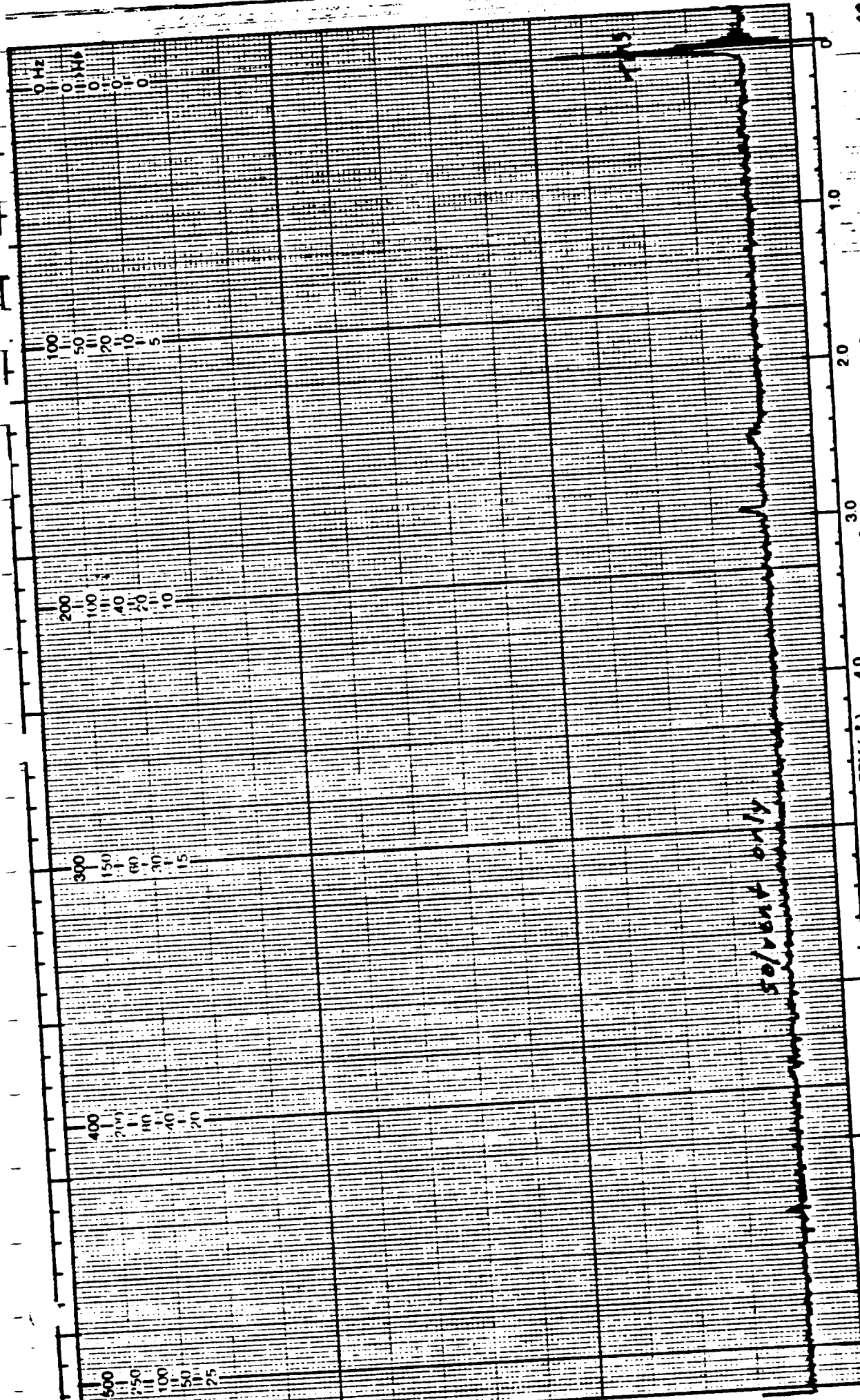
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OF POOR QUALITY

FINGERPRINT VISCOSITY PROFILE 91LD RESIN NASA LOTS-3

	ETA*	ETA'	ETA''	TORQUE	TIME	TEMP
	POISE	POISE	POISE	GRAMS-CM	MIN.	DEG. C
1	3.263e+000	3.117e+000	9.647e-001	4.097e-001	5.000e+001	1.250e+002
2	6.407e+000	5.688e+000	2.950e+000	8.050e-001	5.100e+001	1.270e+002

ORIGINAL PAGE IS
OF POOR QUALITY

SOLVENT ONLY
SCAN



ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS:

SAMPLE: Solvent
SOLVENT: Unid-d + 0.527%
DEC. LEVEL: _____

AUTO ☐

(250)

(500)

(2)

(.05)

MANUAL

SWEEP TIME (SEC): 90

SWEEP WIDTH (Hz): 25

FILTER: 1 2 3 4 5 6 7 8

RF POWER LEVEL: 0.30

SWEEP OFFSET (Hz): 0

SPECTRUM AMPLITUDE: 8.0

INTEGRAL AMPLITUDE: —

SPINNING RATE (RPS): 3.0

SPECTRUM NO. 1A of 7

OPERATOR DGW

DATE: 3-21-86

solvent scan

NORELL, INC.
LANDISVILLE, N.J. 08326

ORIGINAL PAGE IS
OF POOR QUALITY

REMARKS: 0.130 gm sample
0.976 gm solvent

SAMPLE: 9160 Kt #3-1
SOLVENT: Unisd-dro. 87ms
DEC. LEVEL: _____

SPECTRUM NO. 7 of 9 9160

44#3-1

OPERATOR DEW

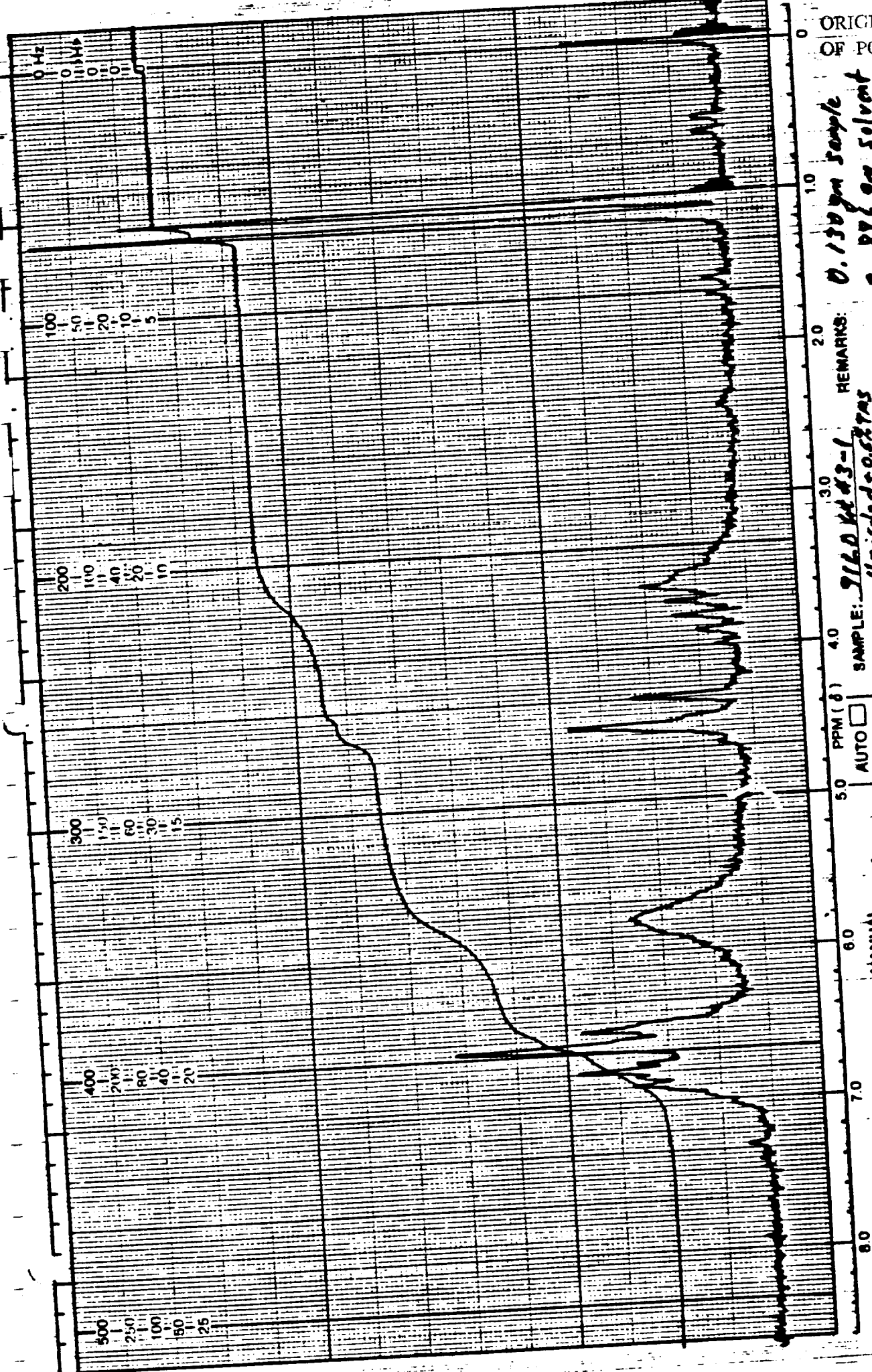
DATE: 3-21-86

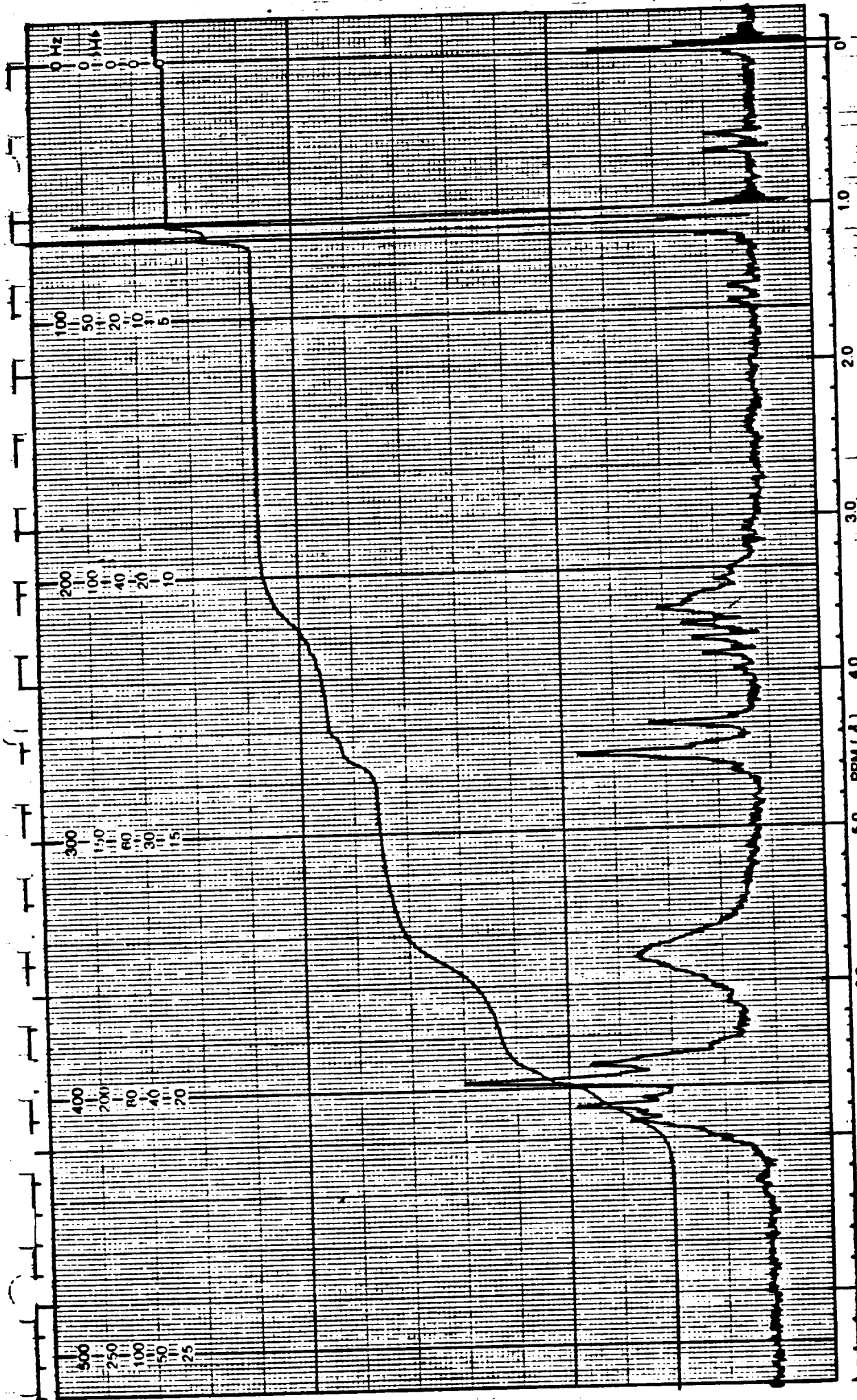
NORELL, INC.
LANDISVILLE, N.J. 08328

SWEEP OFFSET (HZ): 0.0
SPECTRUM AMPLITUDE: 5.0
INTEGRAL AMPLITUDE: 3.0
SPINNING RATE (RPS): 3.0

MANUAL
SWEEP TIME (SEC): 30
SWEEP WIDTH (HZ): 25
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.2

AUTO
(250)
(500)
(2)
(05)





REMARKS: 0.142 gm sample
0.948 gm solvent

SAMPLE: 91LD lt #3-2
SOLVENT: Unisolv-4 + 0.5% TMS
DEC. LEVEL

ORIGINAL PAGE
OF POOR QUALITY

MANUAL ☒ AUTO ☐
SWEEP TIME (SEC): 90 (500 1000)
SWEEP WIDTH (Hz): 25 (50 100 200 500)
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 9.25

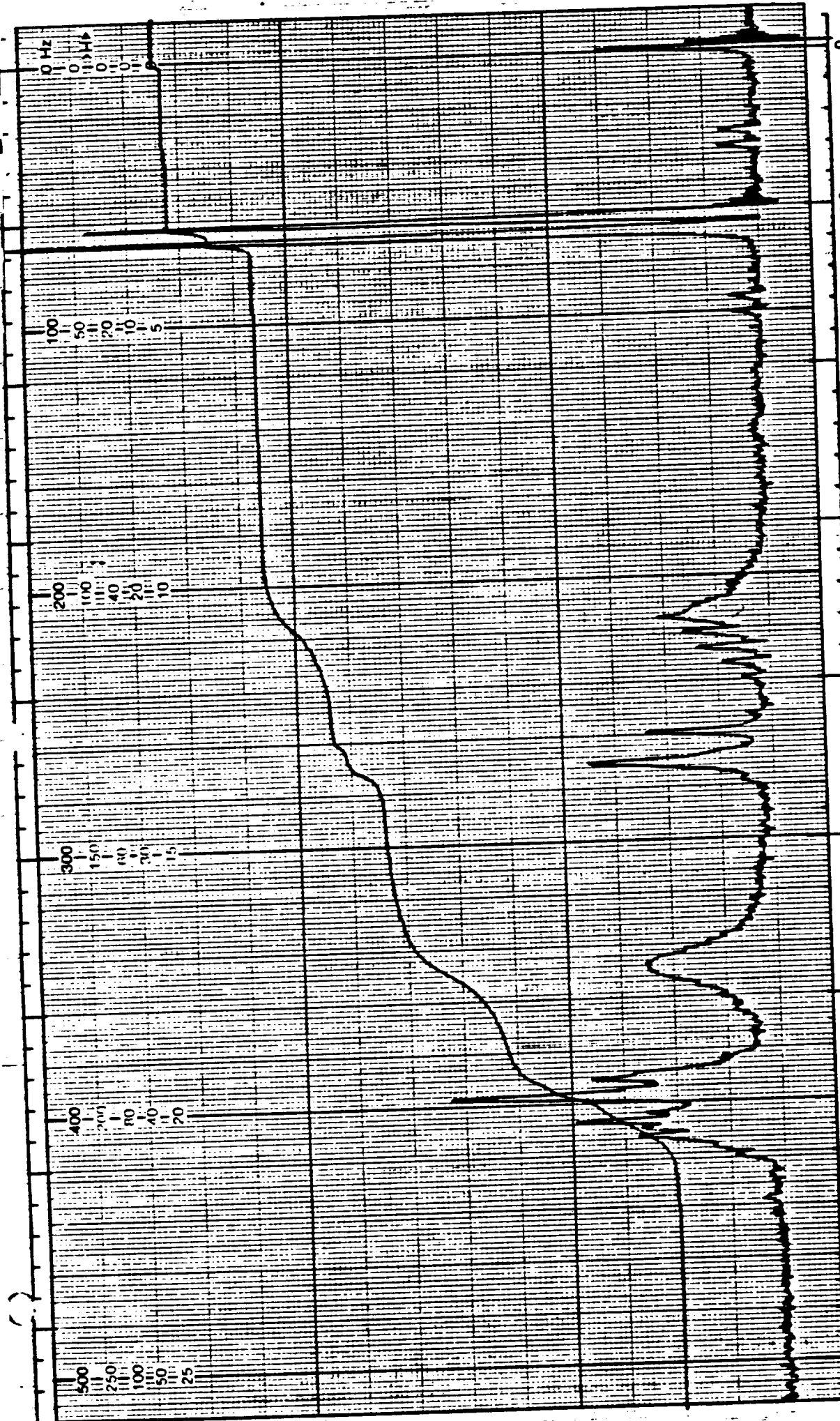
SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 8.0
INTEGRAL AMPLITUDE: 5.0
SPINNING RATE (RPS): 3.0

SPECTRUM NO. 8 of 9 71LD
lt #3-2

OPERATOR DSW

DATE: 3-21-86

NORELL, INC.
LANDISVILLE, N.J. 08326
Phone: (609) 697-0020



REMARKS: 0.139 gm sample
0.944 gm solvent

SAMPLE: 9120-4-3-3
SOLVENT: Unid-40.527ms
DEC. LEVEL: _____

ORIGINAL PAGE IS
OF POOR QUALITY

OPERATOR DEW
SPECTRUM NO. 9079 9120
4-3-3

MANUAL
SWEEP TIME (SEC): 30 (1500 1000)
SWEEP WIDTH (Hz): 25 (50 100 200 500)
FILTER: 1 2 3 4 5 6 7 8
RF POWER LEVEL: 0.25

SWEEP OFFSET (Hz): 0
SPECTRUM AMPLITUDE: 5.0
INTEGRAL AMPLITUDE: 5.0
SPINNING RATE (RPS): 30

DATE: 3-21-86

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NAS8-36298

U.S. Polymeric O.E. 71108

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FABRIC TESTING

NAS8-36298

U.S. POLYMERIC O.E. 71108

CCA-3 Fabric for NASA Lot# 3

1a. Breaking Strength, lbs/in, WARP
ASTM D1682

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
PICK	31	30	38
CENTER	32	32	32
PLAIN	<u>37</u>	<u>31</u>	<u>35</u>
AVG.	33.3	31.0	35.0

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
PICK	32	39	38	34	38
CENTER	30	36	39	31	35
PLAIN	<u>31</u>	<u>46</u>	<u>36</u>	<u>36</u>	<u>38</u>
AVG.	31.0	40.3	37.7	33.7	37.0

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
CENTER	36	47	42	45	37.5
PLAIN	30	38	33	37	33.8
AVG.	<u>37</u>	<u>48</u>	<u>31</u>	<u>34</u>	<u>36.7</u>
	34.3	44.3	35.3	38.7	36.0

1b. Breaking Strength, lbs/in, FILL
ASTM D1682

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
PICK	14	31	30
CENTER	19	31	27
PLAIN	<u>18</u>	<u>31</u>	<u>28</u>
AVG.	17.0	31.0	28.3

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
PICK	32	37	34	29	27
CENTER	28	28	27	30	34
PLAIN	<u>29</u>	<u>30</u>	<u>27</u>	<u>24</u>	<u>34</u>
AVG.	29.7	31.7	29.3	27.7	31.7

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
PICK	18	32	52	43	31.6
CENTER	19	34	44	42	30.3
PLAIN	<u>19</u>	<u>33</u>	<u>41</u>	<u>42</u>	<u>29.7</u>
AVG.	18.7	33.0	45.7	42.3	30.5

2a. Carbon Assay, %
MDQAI 5560

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
PICK	96.8	96.5	96.6
CENTER	96.0	97.1	96.8
PLAIN	<u>97.1</u>	<u>97.2</u>	<u>96.6</u>
AVG.	96.63	96.93	96.67

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
PICK	96.7	96.6	97.3	97.2	96.5
CENTER	96.8	96.8	97.2	96.9	96.4
PLAIN	<u>96.5</u>	<u>96.6</u>	<u>96.8</u>	<u>96.8</u>	<u>95.9</u>
AVG.	96.67	96.67	97.10	96.97	96.27

CCA-3 Fabric for NASA Lot# 32a. Carbon Assay, % (CONTINUED)
MDQAI 5560

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
PICK	96.4	95.7	96.6	96.1	96.58
CENTER	95.9	96.1	96.4	96.0	96.53
PLAIN	<u>96.6</u>	<u>96.7</u>	<u>96.7</u>	<u>95.8</u>	<u>96.61</u>
AVG.	96.30	96.17	96.57	95.97	96.58

2b. Hydrogen Assay, %
MDQAI 5560

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
PICK	.18	.19	.13
CENTER	.16	.17	.15
PLAIN	<u>.15</u>	<u>.15</u>	<u>.15</u>
AVG.	.163	.170	.143

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
PICK	.13	.17	.16	.15	.15
CENTER	.14	.17	.15	.15	.15
PLAIN	<u>.15</u>	<u>.17</u>	<u>.14</u>	<u>.16</u>	<u>.16</u>
AVG.	.140	.170	.150	.153	.153

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
PICK	.16	.14	.15	.13	.153
CENTER	.14	.16	.15	.15	.153
PLAIN	<u>.14</u>	<u>.14</u>	<u>.15</u>	<u>.15</u>	<u>.151</u>
AVG.	.147	.147	.150	.143	.153

2c. Nitrogen Assay, %
MDQAI 5560

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
PICK	.7	.9	.8
CENTER	.7	.8	.8
PLAIN	<u>.8</u>	<u>.8</u>	<u>.8</u>
AVG.	.73	.83	.80

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
PICK	.9	.9	1.0	.8	.8
CENTER	.9	.9	1.0	.9	.8
PLAIN	<u>.9</u>	<u>.8</u>	<u>.9</u>	<u>1.0</u>	<u>.8</u>
AVG.	.90	.87	.97	.90	.80

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
PICK	.9	.9	.9	.6	.84
CENTER	.8	.8	.9	.9	.85
PLAIN	<u>.8</u>	<u>.8</u>	<u>.8</u>	<u>.8</u>	<u>.83</u>
AVG.	.83	.83	.87	.77	.84

See Charts 3A-3F

3. Visual Inspection
QC1-1024. Specific Gravity, Units
PTM-84

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
	2.9910	2.7440	2.8734
	2.9888	2.5514	3.0339
	<u>2.9062</u>	<u>2.6228</u>	<u>3.0715</u>
AVG.	2.962	2.639	2.992

(NOTE: Results are not reliable due to surface activity)

CCA-3 Fabric for NASA Lot# 34. Specific Gravity, Units (CONTINUED)
PTM-84

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
	2.4989	2.3014	2.7607	2.6102	2.6355
	2.6106	2.1918	2.7008	2.6347	2.7418
	<u>2.5835</u>	<u>2.2203</u>	<u>2.7294</u>	<u>2.5935</u>	<u>2.7169</u>
AVG.	2.564	2.238	2.730	2.613	2.698
	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
	2.7068	3.0945	2.6413	2.6548	2.7094
	2.8036	2.9334	2.5773	2.4646	2.6861
	<u>2.8107</u>	<u>2.9026</u>	<u>2.5808</u>	<u>2.5079</u>	<u>2.6872</u>
AVG.	2.774	2.977	2.600	2.542	2.694

5. pH, Units
CTM-24B

AVG.			<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
			7.5	7.2	7.7
			<u>7.4</u>	<u>7.2</u>	<u>7.7</u>
		AVG.	7.45	7.20	7.70
	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
	7.9	7.3	7.2	8.3	8.4
	<u>7.8</u>	<u>7.3</u>	<u>7.1</u>	<u>8.2</u>	<u>8.2</u>
AVG.	7.85	7.30	7.15	8.25	8.30
	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
	7.6	7.6	6.0	7.5	7.52
	<u>7.6</u>	<u>7.5</u>	<u>6.0</u>	<u>7.5</u>	<u>7.46</u>
AVG.	7.60	7.55	6.00	7.50	7.49

6. TGA, °C at 50% Weight Loss
CTM-51 (AIR)

<u>SET UP #1</u>		<u>SET UP #2</u>	
3-1S	647	3-1E	593
3-2S	647	3-2E	590
3-3E	644	3-3S	585
3-4E	651	3-4S	587
3-5E	652	3-5S	585
<u>3-6E</u>	<u>649</u>	<u>3-6S</u>	<u>588</u>
AVG.	648	AVG.	588

See Charts 6A-6L

7a. Atomic Absorption, ppm
CTM-53B

		<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
	Na	395	357	325
	K	40	39	26
	Ca	11	10	5
	Mg	40	58	38
	Li	<u>0</u>	<u>0</u>	<u>0</u>
	AVG.	486	464	394

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
Na	318	325	375	400	382
K	30	26	29	24	35
Ca	5	10	9	7	8
Mg	36	96	52	91	40
Li	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
AVG.	389	457	465	522	465

CCA-3 Fabric for NASA Lot# 37a. Atomic Absorption, ppm (CONTINUED)
CTM-53B

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
Na	446	333	395	362	367.8
K	40	34	23	23	30.8
Ca	2	11	12	2	7.7
Mg	42	52	60	45	54.2
Li	0	0	0	0	0
AVG.	530	430	490	432	460.3

7b. Moisture Content, %
CTM-53B

#3-1S	7.188	#3-4S	6.811
#3-1E	6.762	#3-4E	6.491
#3-2S	7.021	#3-5S	6.609
#3-2E	7.001	#3-5E	6.618
#3-3S	6.846	#3-6S	6.741
#3-3E	6.724	#3-6E	6.428
Lot# 3	AVERAGE		6.770

7c. Ash Content, %
CTM-53B

#3-1S	.115	#3-4S	.155
#3-1E	.095	#3-4E	.234
#3-2S	.089	#3-5S	.222
#3-2E	.114	#3-5E	.109
#3-3S	.135	#3-6S	.105
#3-3E	.210	#3-6E	.070
Lot# 3	AVERAGE		.138

8a. Filament diameter, microns, WARP
S.E.M. procedure
(diameters are an average
of 10 measurements)

	<u>#3-1S</u>	<u>#3-2S</u>	<u>#3-3S</u>
AVERAGE	10.82	11.08	10.76
Minimum	10.00	10.00	9.40
Maximum	11.85	14.00	12.00
Std. Dev	0.53	1.28	0.89

	<u>#3-4S</u>	<u>#3-5S</u>	<u>#3-6S</u>	<u>LOT3 AVG</u>
AVERAGE	11.14	10.48	12.38	11.11
Minimum	10.40	8.80	9.00	8.80
Maximum	11.85	11.60	15.95	15.95
Std. Dev	0.53	1.02	2.02	1.27

8b. Filament diameter, microns, FILL
S.E.M. procedure
(diameters are an average
of 10 measurements)

	<u>#3-1S</u>
AVERAGE	12.73
Minimum	11.50
Maximum	15.65
Std. Dev	1.20

9a. Thread Count, per inch, WARP
PTH-5A

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
	52	52	52
	53	52	52
	53	52	52
	52	52	53
	53	52	53
AVG.	52.6	52.0	52.4

CCA-3 Fabric for NASA Lot# 39a. Thread Count, per inch, WARP (CONTINUED)
PTM-5A

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
	52	52	52	52	53
	52	52	53	52	53
	53	52	53	51	52
	53	52	52	52	52
	<u>53</u>	<u>53</u>	<u>52</u>	<u>52</u>	<u>53</u>
AVG.	52.6	52.2	52.4	51.8	52.6
	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
	52	54	53	53	52.4
	52	53	53	54	52.6
	52	53	53	53	52.4
	52	52	52	53	52.3
	<u>52</u>	<u>52</u>	<u>52</u>	<u>53</u>	<u>52.5</u>
AVG.	52.0	52.8	52.6	53.2	52.4

9b. Thread Count, per inch, FILL
PTM-5A

er inch, FILL		<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>	
		49	49	50	
		49	49	49	
		49	48	49	
		49	49	50	
		<u>49</u>	<u>49</u>	<u>49</u>	
	AVG.	49.0	48.8	49.4	
	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
	50	50	49	49	50
	49	49	49	49	50
	50	49	49	49	50
	50	49	49	49	50
	<u>49</u>	<u>49</u>	<u>50</u>	<u>49</u>	<u>50</u>
AVG.	49.6	49.2	49.2	49.0	50.0
	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
	49	47	49	49	49.2
	49	48	49	49	49.0
	50	48	49	50	49.2
	49	49	49	49	49.3
	<u>50</u>	<u>48</u>	<u>49</u>	<u>49</u>	<u>49.2</u>
AVG.	49.4	48.0	49.0	49.2	49.2

10a. Areal weight as received, gm/4x4
PTM-3A

AVG.					
as received, gm/4x4					
	LEFT	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>	
	CENTER	3.108	2.991	3.053	
	RIGHT	3.148	3.008	3.045	
	AVG.	<u>3.082</u>	<u>3.001</u>	<u>3.040</u>	
		3.113	3.000	3.046	

CCA-3 Fabric for NASA Lot# 3

10a. Areal weight as received, gm/4x4 (CONTINUED)

PTM-3A

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
LEFT	3.012	3.030	3.030	3.089	3.064
CENTER	3.007	2.982	2.980	3.046	3.036
RIGHT	<u>3.080</u>	<u>3.076</u>	<u>2.942</u>	<u>3.065</u>	<u>3.057</u>
AVG.	3.033	3.029	2.984	3.067	3.052

10b. Volatiles as received, %
PTM-3A

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
LEFT	8.85	6.85	7.21
CENTER	8.74	7.05	6.60
RIGHT	<u>8.21</u>	<u>7.16</u>	<u>6.41</u>
AVG.	8.60	7.02	6.74

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
LEFT	6.42	6.61	7.17	8.20	6.50
CENTER	6.13	6.92	7.40	8.11	6.31
RIGHT	<u>5.54</u>	<u>7.59</u>	<u>8.07</u>	<u>8.04</u>	<u>6.24</u>
AVG.	6.03	7.04	7.54	8.12	6.35

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
LEFT	6.91	6.50	6.50	6.54	7.02
CENTER	6.78	6.44	6.48	6.96	6.99
RIGHT	<u>7.11</u>	<u>7.22</u>	<u>6.56</u>	<u>5.81</u>	<u>7.00</u>
AVG.	6.93	6.72	6.51	6.44	7.00

10c. Weight Change on Acetone Wash, %
PTM-3A

	<u>#3-1S</u>	<u>#3-1E</u>	<u>#3-2S</u>
LEFT	-.39	-1.97	-2.08
CENTER	.73	-1.90	-2.50
RIGHT	<u>-.64</u>	<u>-1.72</u>	<u>-2.57</u>
AVG.	-.59	-1.86	-2.38

	<u>#3-2E</u>	<u>#3-3S</u>	<u>#3-3E</u>	<u>#3-4S</u>	<u>#3-4E</u>
LEFT	-3.18	-3.11	-2.25	-.81	-.35
CENTER	-3.18	-2.83	-1.93	-.96	-.14
RIGHT	<u>-3.34</u>	<u>-2.29</u>	<u>-1.35</u>	<u>-1.20</u>	<u>.00</u>
AVG.	-3.23	-2.74	-1.84	-.99	-.16

	<u>#3-5S</u>	<u>#3-5E</u>	<u>#3-6S</u>	<u>#3-6E</u>	<u>LOT3 AVG</u>
LEFT	.04	-.07	-.11	.35	-1.16
CENTER	-.14	-.29	-.04	.42	-1.18
RIGHT	<u>.00</u>	<u>-.21</u>	<u>-.04</u>	<u>.07</u>	<u>-1.11</u>
AVG.	-.04	-.19	-.06	.28	-1.15

U.S. Polymeric



Hamid M. Quraishi, Manager
Quality Assurance Department

ORIGINAL PAGE IS
OF POOR QUALITY

DATE 3/21/80

FOOTAGE HT	START	6. W	START	LEFT
20				
40	66 W		24 W 530	
60		67 W		
80		94 W - 118		
100				
120	153 W	195 W - 168		
140				
160	W 174			
180		192 W		
200	210 - 1212 W	201 W		
220	W 230	223 SPLICE		
240	242 - 43-44 W			
260				
280				
300		314 W	306 W	
320		335 W		
340	352 W - 355 W			
360	END 395	Sample		
380	END			
400				
420				
440				
460				
480				
500				

FABRIC CCA-3-43
MFG. Hiteo
ROLL NO. 18894
YARDS 137 yds
POUNDS 82.7 lbs
ORDER NO. 71108
SPECIFICATION STC4-3184 SCV2
Q.C. FILE # NASA 3-1
SYMBOLS

W W W

- TEAR

● ●

- SPOTS OR STAINS

△ △

- FOLDS

S

- EDGE CURL

H

- TIGHT WEAVE OR SELVAGE

W

- WEAVE DISTORTION

V

- VISIBLE PUCKERS

V

- ONE PUCKER CREASING

V

- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 3-1
START and END

GRADE Group B

A

DATE 3/21/86

IT	Footage	START	Sample	LEFT
0	19 W	29 W	55-84 W	4 W
10		60 W		
20		82 W 91 W		
30	100 W 113 W	119 W	106 W	
40	145 W 150 W			
50		170 W	164 W	
60		182 W 189 W 191 W		
70		205 SPLICED		
80		230 W -		
90			242 W	
100			267 W 271 W	
110		291 W - 294 W - 296 W -		
120		315 W 323-24-27		
130		331 W 32-33		
140		350 W		
150	371 W			
160	380 W	44 W 402 W		
170				
180		421 W 425 W		
190	END	426 W	SAMPLE	
200				
210				
220				
230				
240				
250				
260				
270				
280				
290				
300				

FABRIC CCA-3-43'
 MFG. HITCO
 ROLL NO. 18899
 YARDS 149.3
 POUNDS 90.9
 ORDER NO. 71108
 SPECIFICATION STUT 3184 SCW-2
 Q.C. FILE # NASA-3-2
 SYMBOLS



- TEAR



- SPOTS OR STAINS



- FOLDS



- EDGE CURL



- TIGHT WEAVE OR SELVAGE



- WEAVE DISTORTION



- VISIBLE PUCKERS



- ONE PUCKER CREASING



- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 3-2
 START and END

GRADE Group B

ORIGINAL PAGE IS
OF POOR QUALITY

ISP NO. CHART 3C

DATE 3/21/86

FOOTAGE

LEFT

FT	START	Sample 4 W
0		84 W
10		91 W
20		68 W 73 W
30		94 W
40	101 W	111-114 W
50		123 W
60		133 W 134 W
70		153 154 W
80		163 W
90		187 W
100		202 W
110	232 W	234 SPlice
120	237 W	237 W
130	247 W	247 W
140		241 W 271 W
150		281-297 W
160		209 W
170		214 W 225 W
180		329-350 W
190		317 W - 365
200		377 W 380 W
210		380-385 W
220	408 W	218 W
230		423-24
240		439
250	END	454 Sample
260		
270		
280		
290		
300		

FABRIC CCA-3-43'
MFG. HITCO
ROLL NO. 18898
YARDS 158.9
POUNDS 96.6
ORDER NO. 71108
SPECIFICATION STW-3184 SCW 2
Q.C. FILE # NASA 3-3
SYMBOLS

- W W W - TEAR
● ● - SPOTS OR STAINS
△ △ - FOLDS
S - EDGE CURL
+ - TIGHT WEAVE OR SELVAGE
W - WEAVE DISTORTION
V - VISIBLE PUCKERS
V - ONE PUCKER CREASING
V - TWO OR MORE CREASINGS

REMARKS

NASA Roll # 3-3
START and END

GRADE Gray B

113

ORIGINAL PAGE IS
OF POOR QUALITY

USP NO.

DATE 3/21/86

FOOTAGE

IT	START	4 W	Sample	LEFT
10		29 W		34 W
20	4245 W	47 W		
30	71 W	64 W		
40		114 W		
50	137 W	138 W		
60	150	172		
70		182		
80	214	202 W		
90		208		
100		243 W		
110	278	298 W		
120	497-298			
130		337 W		
140	557 W			
150		572 W		
160		599 W		
170		602 W		
180	421 W			
190	426-429 W			
200	END	END 543	Sample	
210				
220				
230				
240				
250				
260				
270				
280				
290				
300				

FABRIC

CCA-3 -43"

MFG.

H.TCO

ROLL NO.

18897

YARDS

152

POUNDS

94.1

ORDER NO.

71108

SPECIFICATION

STW-31845W-2

Q.C. FILE #

NASA 3-4

SYMBOLS

W W W

- TEAR

● ●

- SPOTS OR STAINS

△ △

- FOLDS

S

- EDGE CURL

+

- TIGHT WEAVE OR SELVAGE

W

- WEAVE DISTORTION

V

- VISIBLE PUCKERS

V

- ONE PUCKER CREASING

V

- TWO OR MORE CREASINGS

TREATMENT OPERATOR READ UP

REMARKS

NASA Roll # 3-4
START and END

GRADE

Group C

ORIGINAL PAGE IS
OF POOR QUALITY

FOOTING

IT	START 4 N	52 1/2	LEFT
20	24 1/2 87 W	27 W	
40		53 N 97 W	
60		79 W 73 W	
80			
100		108-115 W	
120		135 W	
140		158 W	
160		170 175	
180	193 W	180 182 V	
200	202	210 210 SPLICE	
220	234 V	287 SPLICE	
240			
260		272 W 279 W	281 W
280			292 W
300		313 SPLICE	301 W
320			
340		35 F W	
360			377 W
380		391 W 386 W	398 W
400	405 W	410 W	
420	END 427	52 1/2	
440			
460			
480			
500			

TREATMENT OPERATOR READ UP

DATE 3/21/86
 FABRIC CCA-3-43"
 MFG. HITCO
 ROLL NO. 18896
 YARDS 147.1
 POUNDS 89.5
 ORDER NO. 71108
 SPECIFICATION STW-3184-SER 2
 Q.C. FILE # NASA-3-5
 SYMBOLS

W W W

- TEAR

● ●

- SPOTS OR STAINS

△ △

- FOLDS

S

- EDGE CURL

H

- TIGHT WEAVE OR SELVAGE

W

- WEAVE DISTORTION

V

- VISIBLE PUCKERS

V

- ONE PUCKER CREASING

V

- TWO OR MORE CREASINGS

REMARKS

NASA Roll # 3-5
 START and END










 GRADE Group B

DATE 3/21/86

FOOTAGE	LEFT
0	278 FT 2W 11 W Sample
10	230 W 27 W 26 W
20	43 W 48 W 07 52
30	90 W 93 W 96 W
40	124 W 140 W 154 W
50	170 W 170 W 170 W
60	208 W 212 W
70	230 SPOKE 235 W 242 W
80	276 W 298 W
90	302 W
100	345 W
110	378 W
120	390 W 403 W 414 W
130	424 W
140	444 W 455 W
150	END END 454 Sample
160	
170	
180	
190	
200	

FABRIC CCA-3-43"
MFG. HITCO
ROLL NO. 18895
YARDS 157.5
POUNDS 97.4 lbs
ORDER NO. 71108
SPECIFICATION STW4-31845CN-2
Q.C. FILE # NASA 3-6

SYMBOLS

-  - TEAR
-  - SPOTS OR STAINS
-  - FOLDS
-  - EDGE CURL
-  - TIGHT WEAVE OR SELVAGE
-  - WEAVE DISTORTION
-  - VISIBLE PUCKERS
-  - ONE PUCKER CREASING
-  - TWO OR MORE CREASINGS

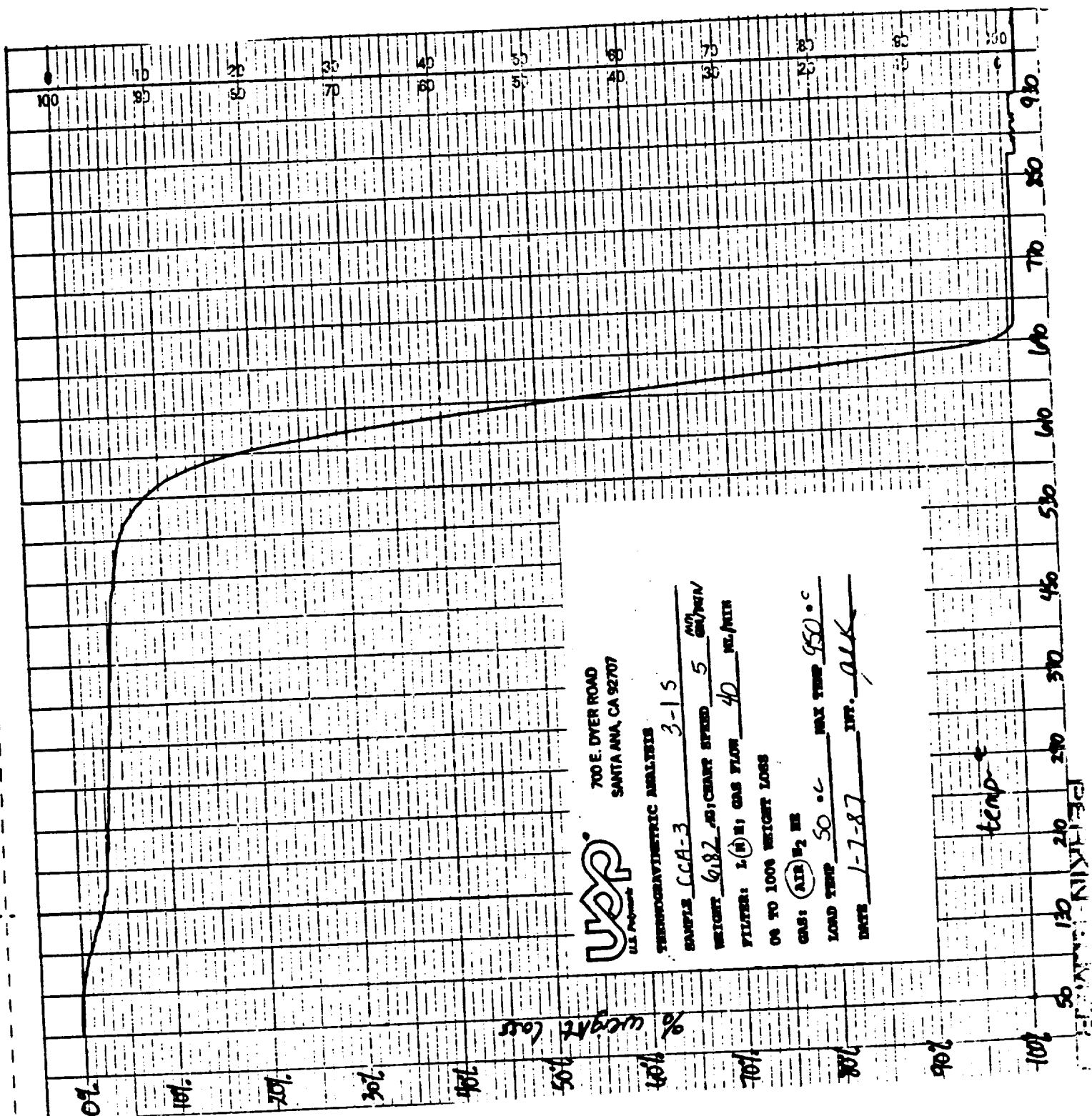
REMARKS

NASA Roll # 3-6
START and END

GRADE Grav B

AKW

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OF POOR QUALITY



700 E. DYER ROAD
SANTA ANA, CA 92707

UAP
ULS ANALYTICAL

THERMOGRAVIMETRIC ANALYSIS

SAMPLE CCA-3 3-15

WEIGHT 6.82 g; CHART SPEED 5 $\frac{mg}{min}$

FILTER: 1/8" GAS FLOW 40 mL/min

ON TO 100% WEIGHT LOSS

GAS: AIR H_2 IS

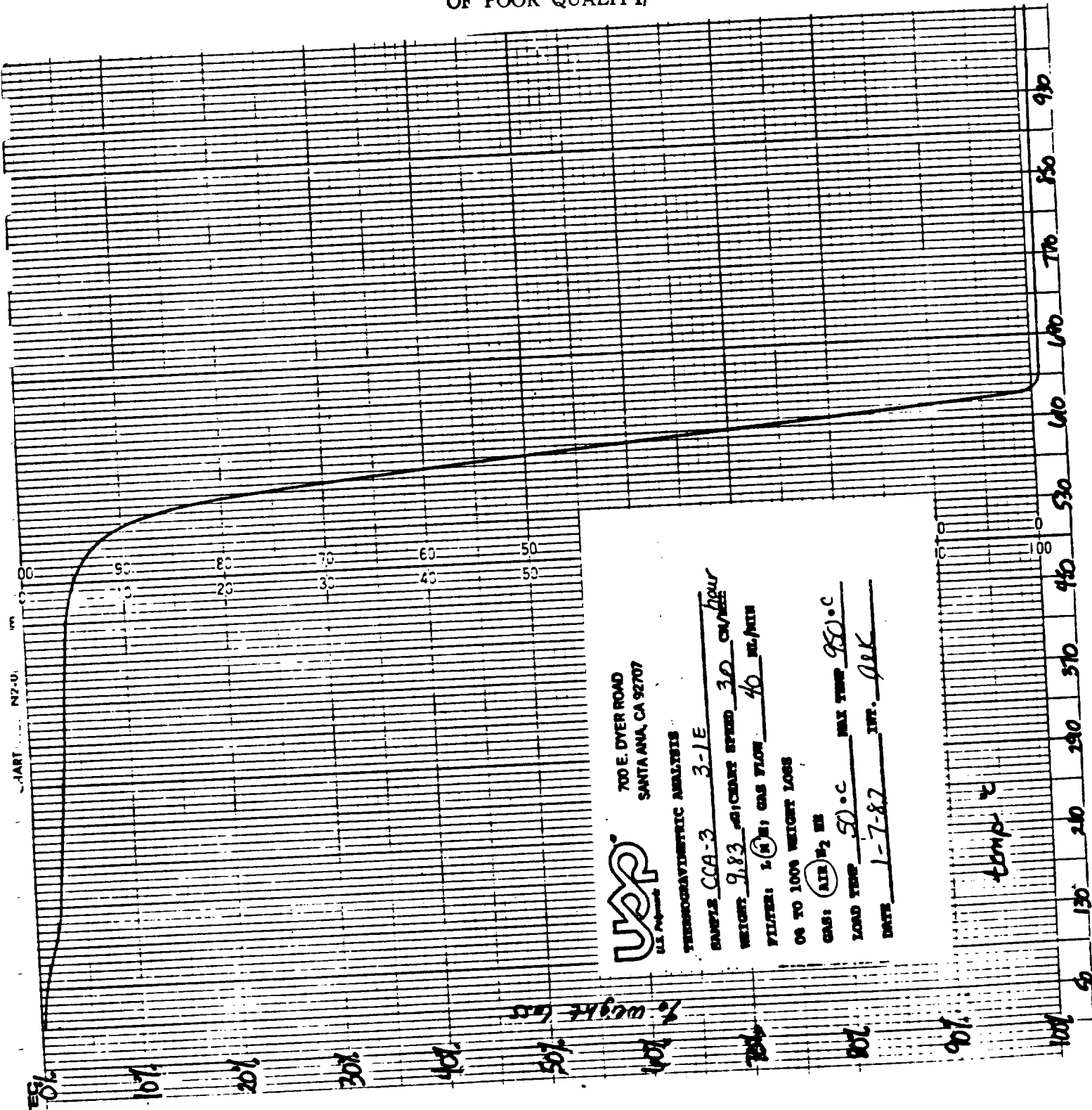
LOAD TEMP 50 °C MAX TEMP 950 °C

DATE 1-7-87 INT. alk

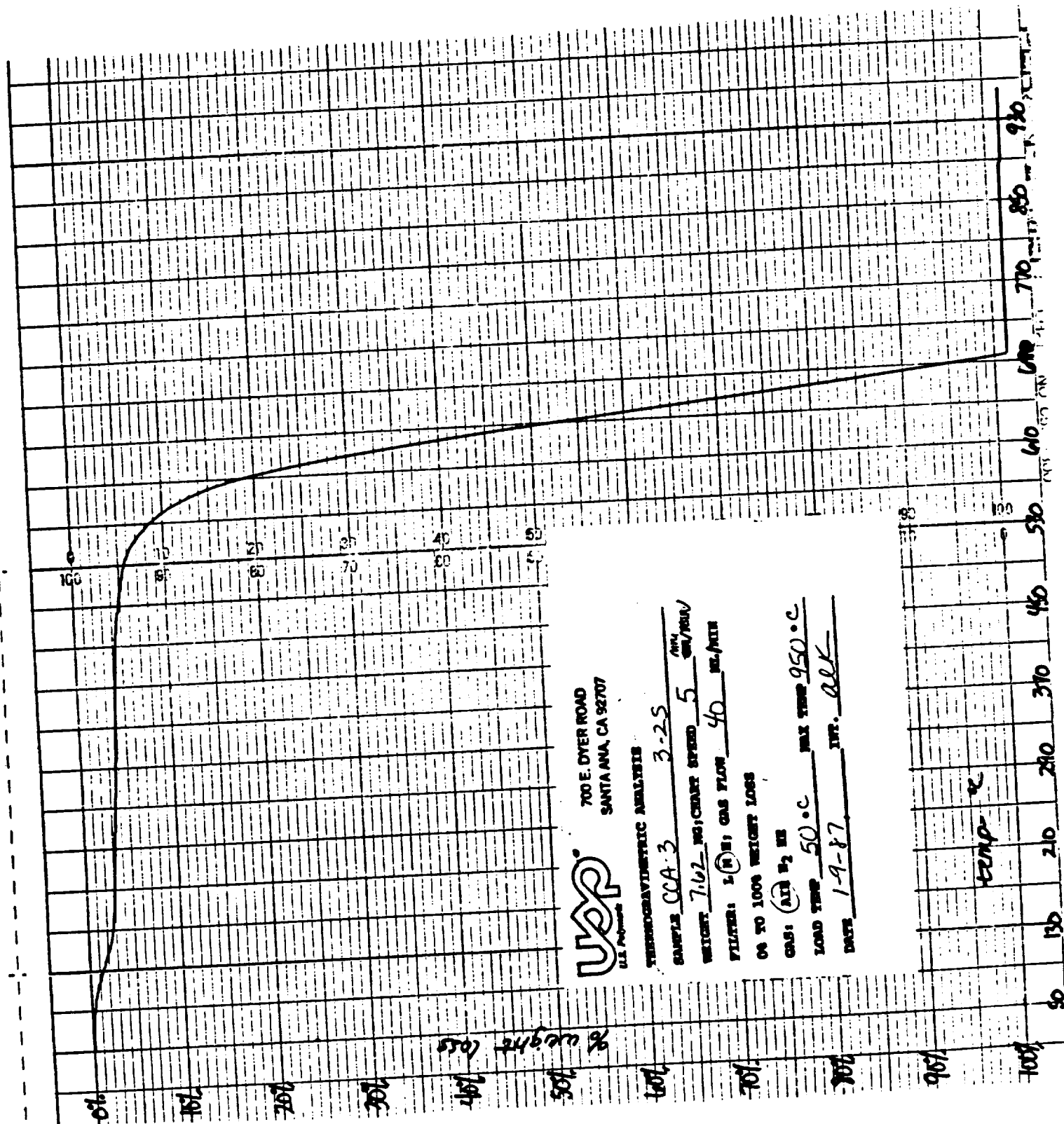
temp °C

PERKIN-ELMER

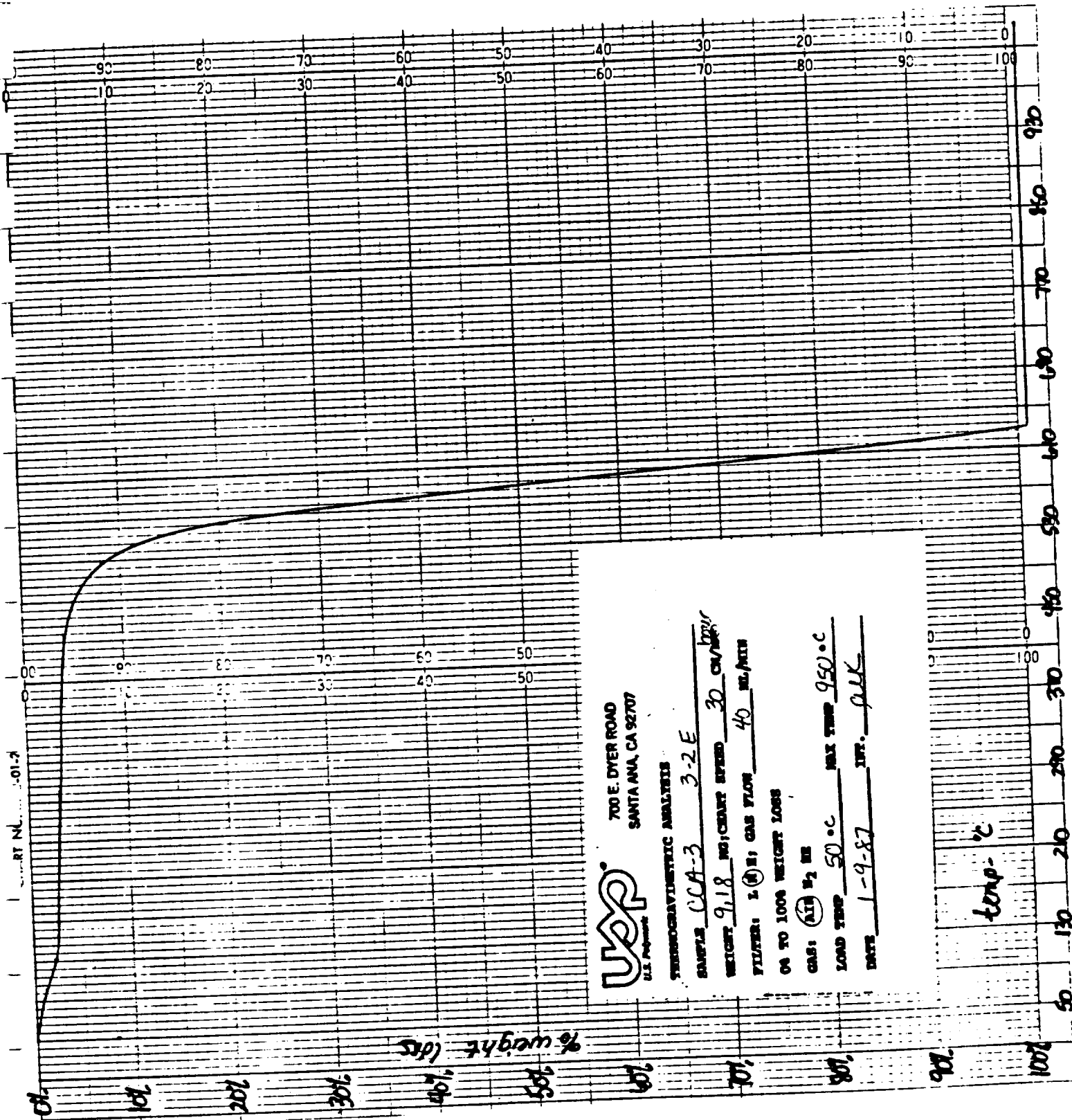
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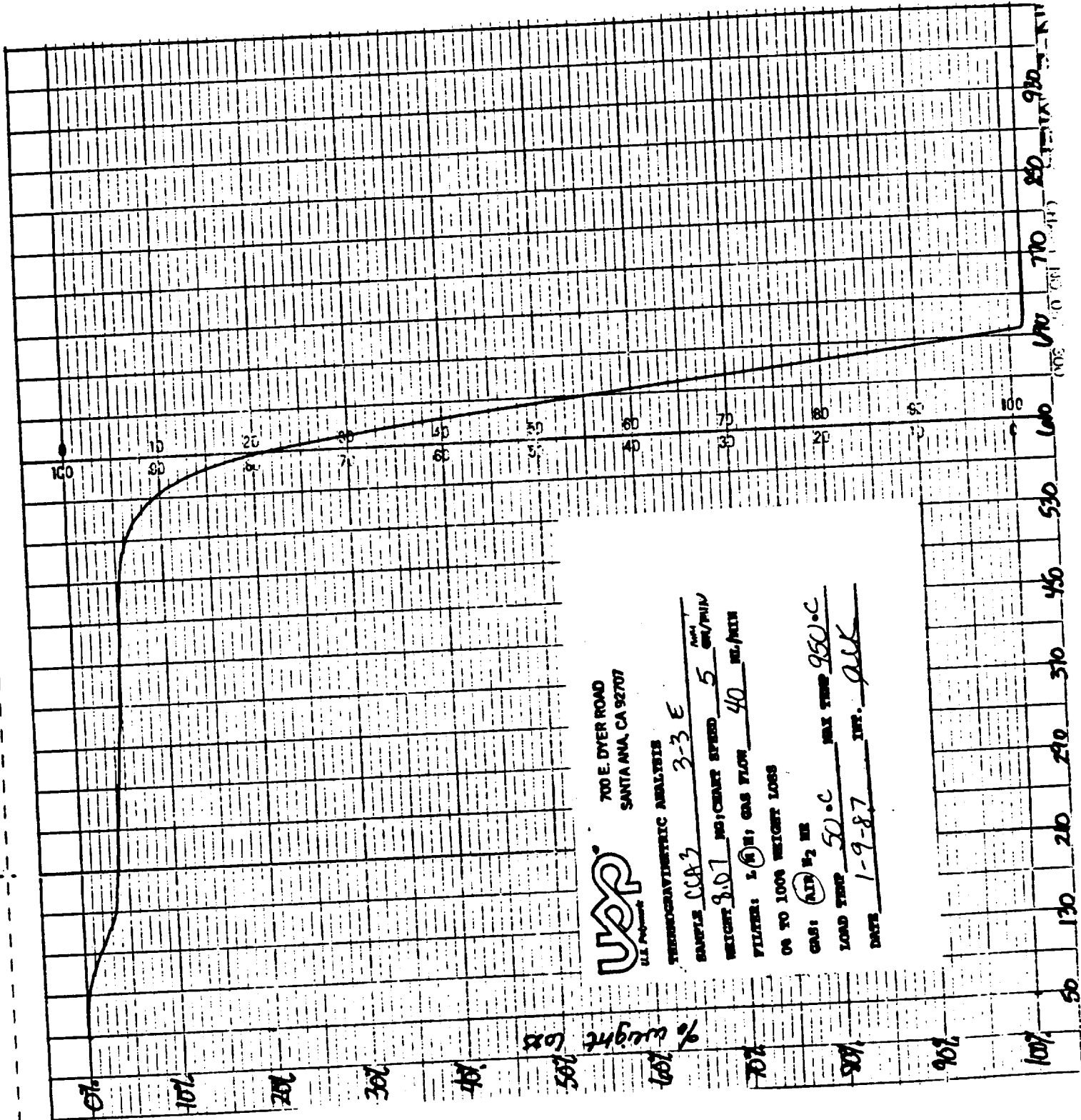
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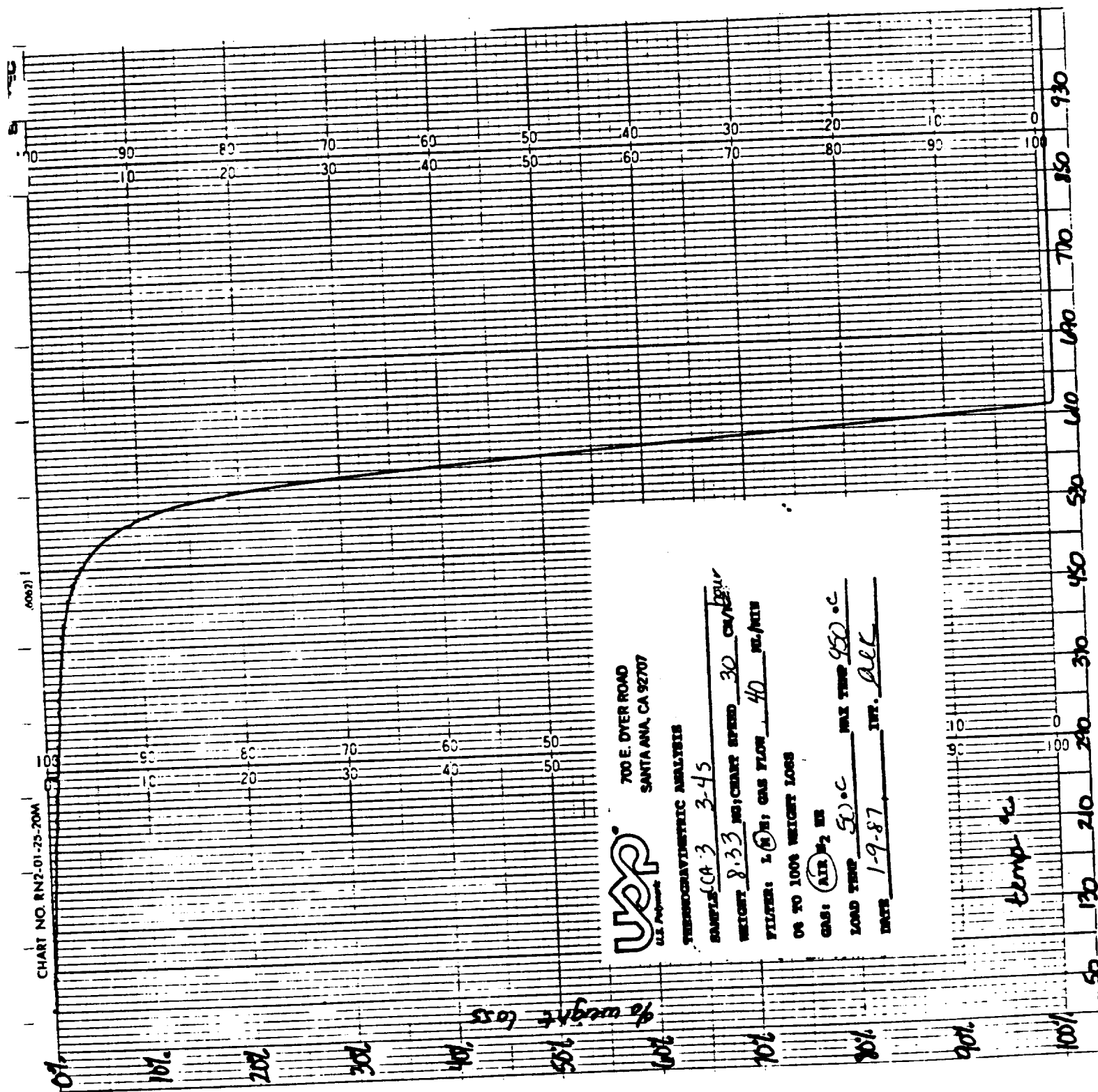
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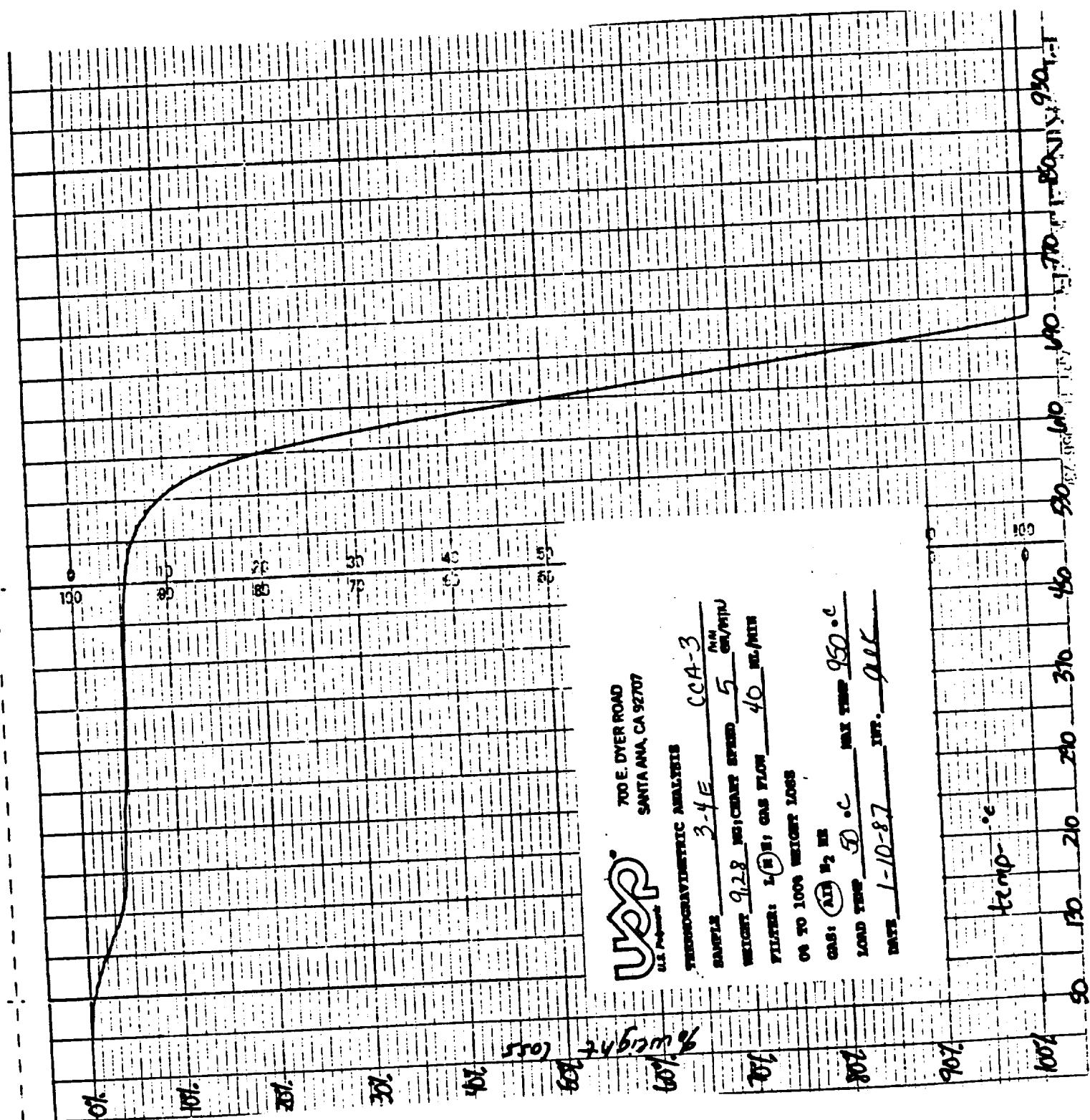
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UAP
U.S. Patents

700 E. DYER ROAD
SANTA ANA, CA 92707

THEMOGRAVIMETRIC ANALYSIS

SAMPLE 3-4E CCA-3

WEIGHT 9.28 mg; CHART SPEED 5 mm/min

FILTER: 1/8"; GAS FLOW 40 ml/min

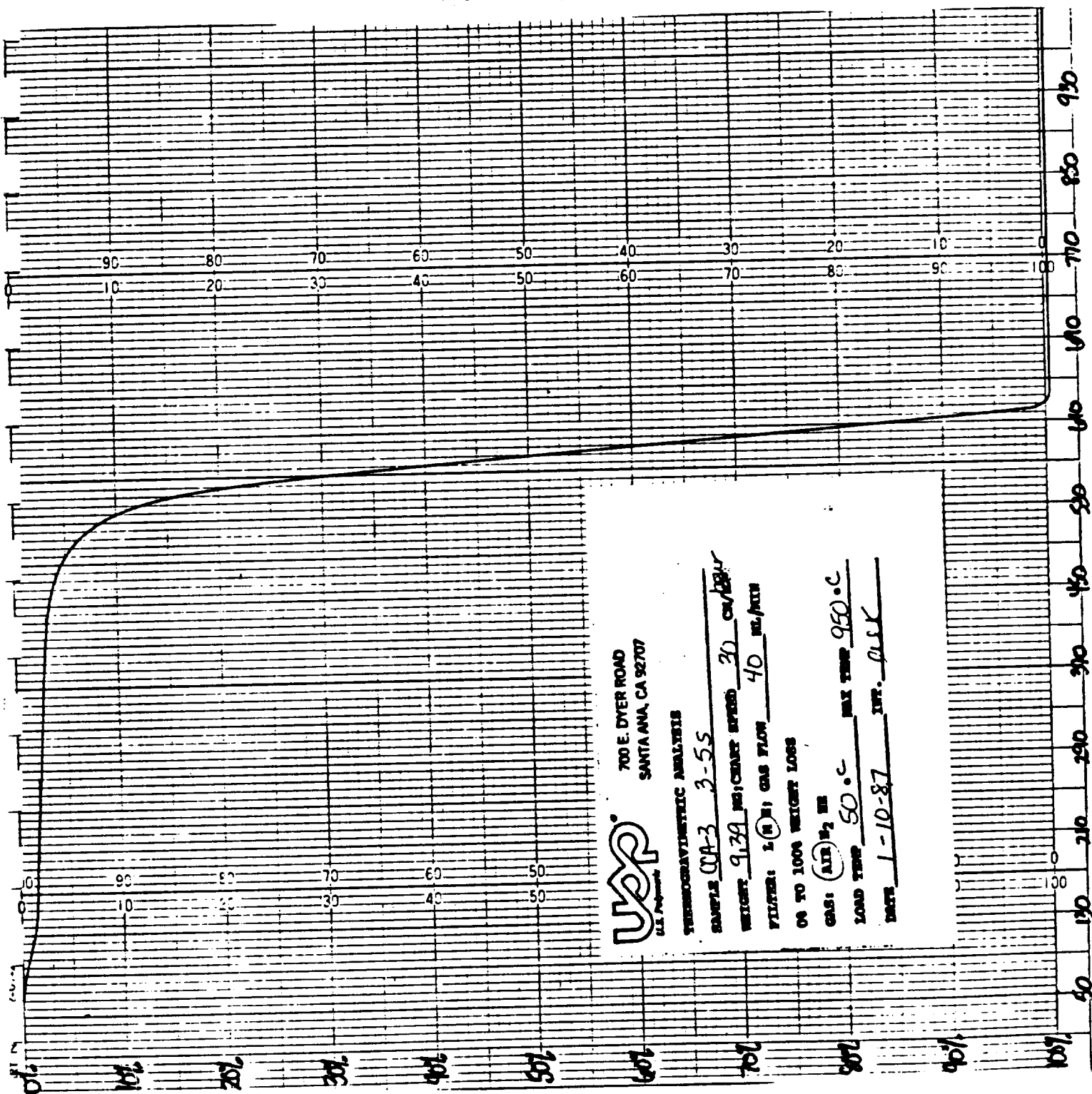
ON TO 100% WEIGHT LOSS

GAS: AIR N₂ HE

LOAD TEMP 50 °C MAX TEMP 950 °C

DATE 1-10-87 INV. gck

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OF POOR QUALITY



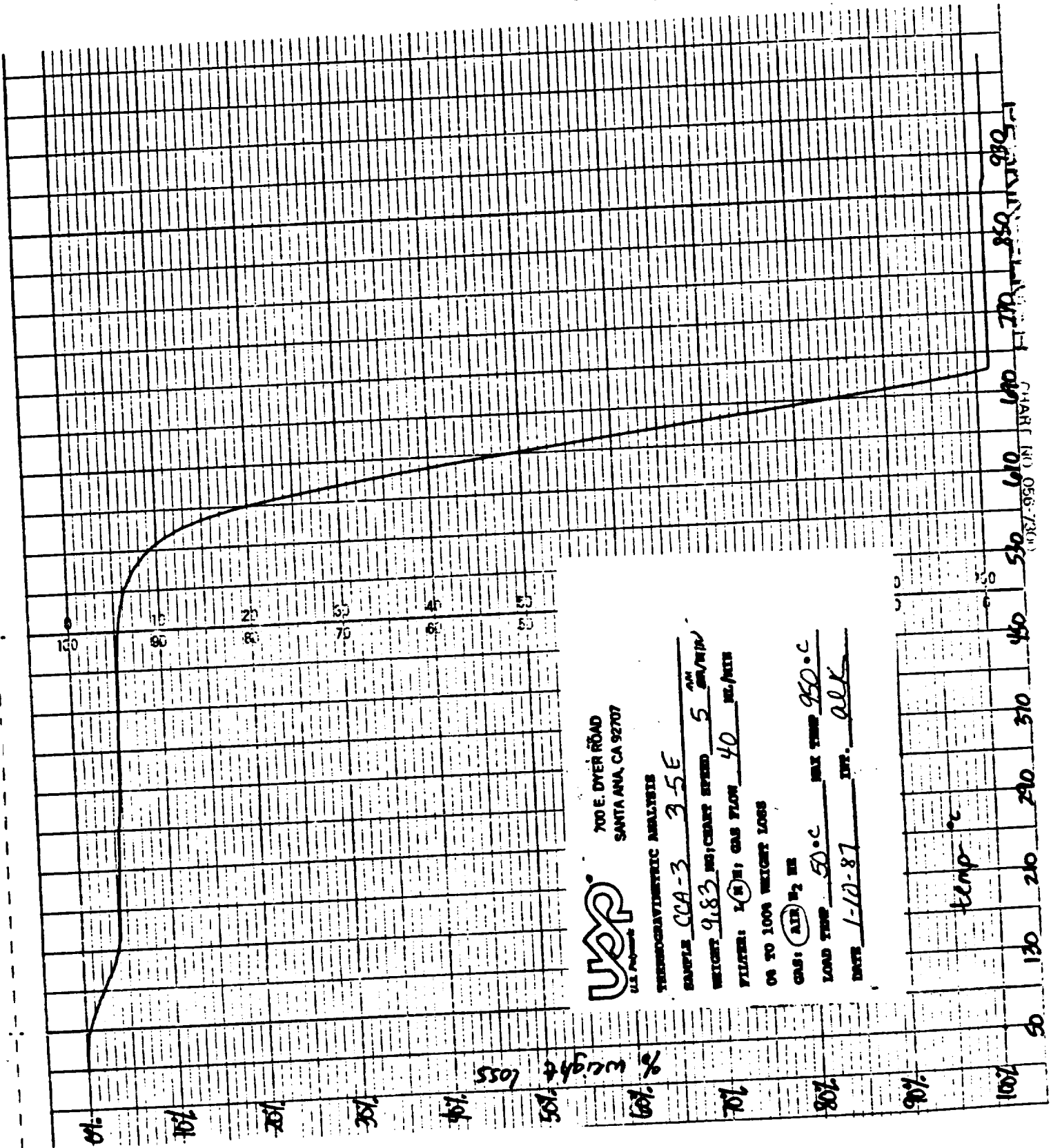
700 E. DYER ROAD
SANTA ANA, CA 92707

THEMOCRAVIMETRIC ANALYSIS

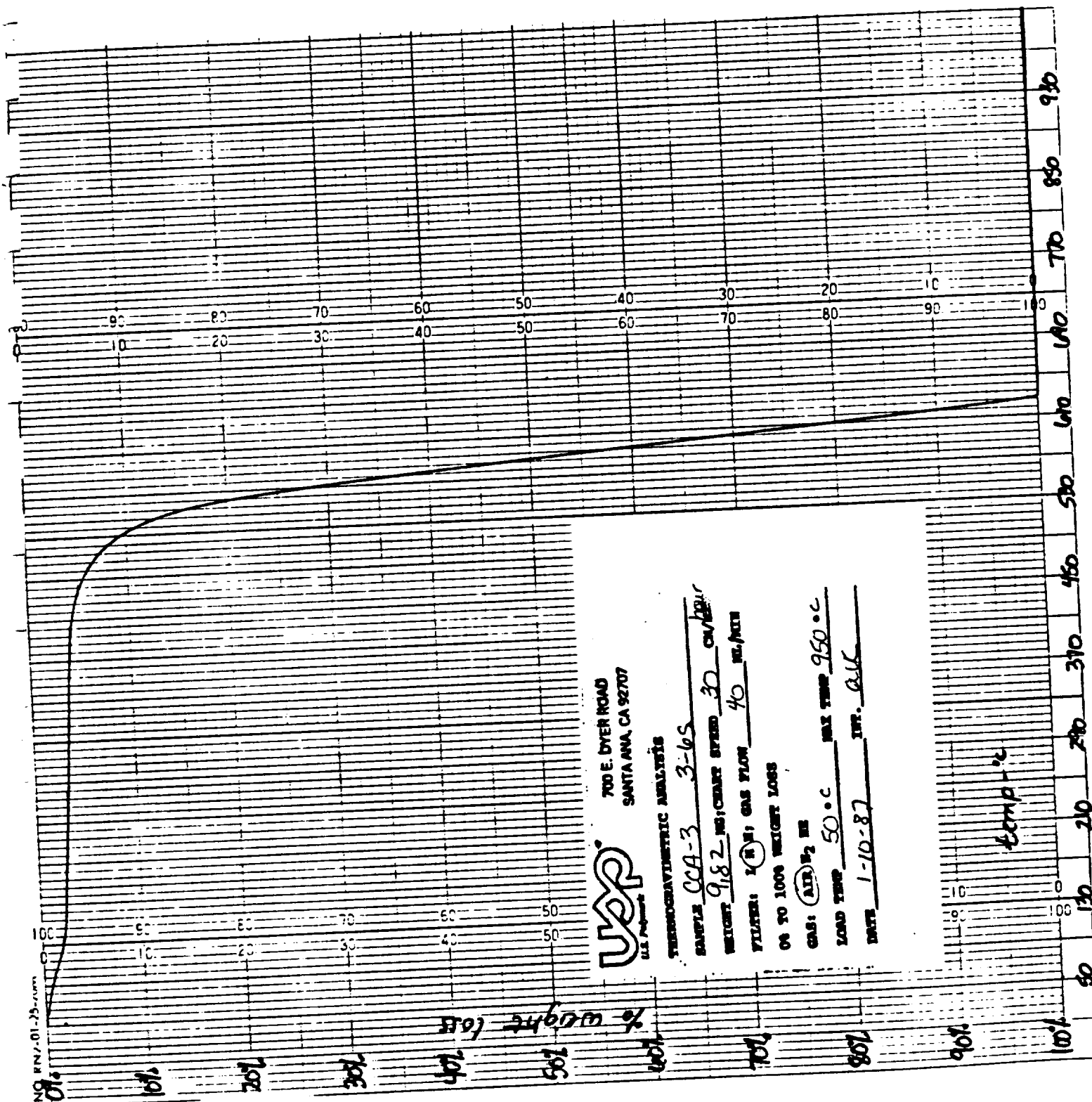
SAMPLE CA-3 3-55
 WEIGHT 9.39 MG; CRACK SPEED 30 CM/HR
 FILTER: 1/8" GAS FLOW 40 ML/MIN
 OR TO 100% WEIGHT LOSS
 GAS: AIR H₂ IN
 LOAD TEMP 50 °C MAX TEMP 950 °C
 DATE 1-10-87 INT. PLK

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CHART 5



ORIGINAL PAGE IS
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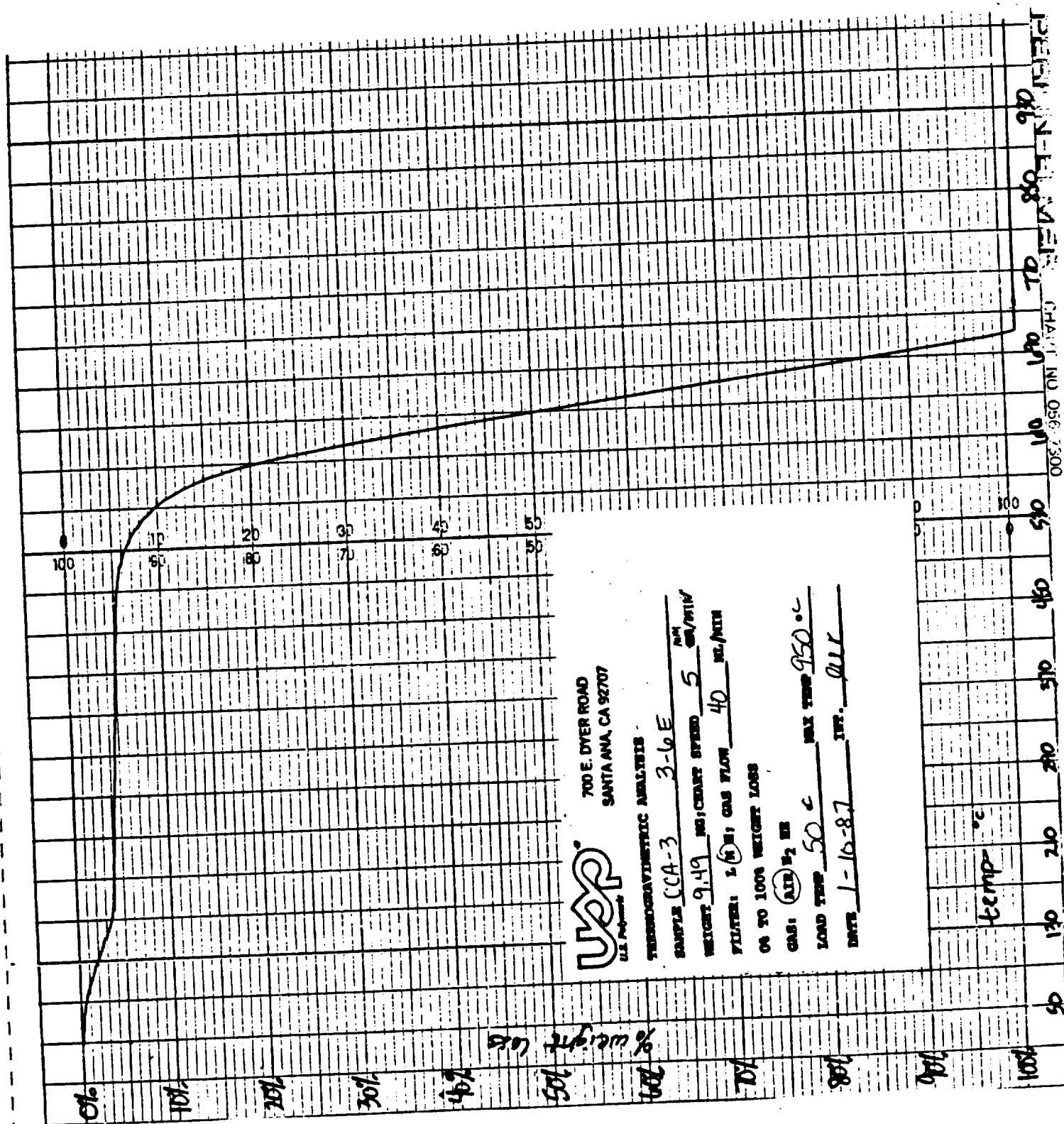


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NAS8-36298

U.S. Polymeric O.E. 71108

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

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PREPREG TESTING

NAS8-36298

U.S. POLYMERIC O.E.71108

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

1a. Resin Content, Soxhlet, %
CTM-6D

				ROLL#1 <u>START</u>	ROLL#1 <u>END</u>	ROLL#2 <u>START</u>	ROLL#2 <u>END</u>
				35.4	33.6	35.9	36.5
				35.1	34.4	36.3	35.1
				<u>32.7</u>	<u>34.7</u>	<u>35.5</u>	<u>37.8</u>
			AVG.	34.4	34.2	35.9	36.5
	ROLL#3 <u>START</u>	ROLL#3 <u>END</u>	ROLL#4 <u>START</u>	ROLL#4 <u>END</u>	ROLL#5 <u>START</u>	ROLL#5 <u>END</u>	ROLL#6 <u>START</u>
	33.5	33.8	33.9	33.5	33.8	33.8	33.7
	32.0	33.9	32.4	35.2	32.7	33.2	33.0
	<u>32.9</u>	<u>33.9</u>	<u>32.0</u>	<u>33.3</u>	<u>35.3</u>	<u>33.1</u>	<u>34.8</u>
AVG.	32.8	33.9	32.8	34.0	33.9	33.4	33.8
	ROLL#6 <u>END</u>	ROLL#7 <u>START</u>	ROLL#7 <u>END</u>	ROLL#8 <u>START</u>	ROLL#8 <u>END</u>	ROLL#9 <u>START</u>	ROLL#9 <u>END</u>
	35.8	35.9	33.1	--	--	--	--
	33.5	33.4	32.2	--	--	--	--
	<u>35.5</u>	<u>35.9</u>	<u>32.2</u>	--	--	--	--
AVG.	34.9	35.1	32.5	--	--	--	--

NASA LOT# 3 AVERAGE 34.1

[illegible]

Cloth Content, Soxhlet, %		ROLL#1		ROLL#1		ROLL#2		ROLL#2	
CTM-6D		START		END		START		END	
		49.7	52.3	49.0	48.2	48.4	50.1	49.6	46.3
		50.1	51.1	48.4	50.1	49.6	46.3	49.0	48.2
		53.6	50.7	49.6	46.3	49.0	48.2		
		51.1	51.4	51.4					
AVG.									
ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#5	ROLL#6	ROLL#6	ROLL#6
START	END	START	END	START	END	END	START	START	START
52.4	52.0	51.9	52.4	52.0	52.0	52.0	52.1	52.1	52.1
54.6	51.9	54.0	50.0	53.6	52.9	52.9	53.1	53.1	53.1
53.3	51.9	54.6	52.7	49.9	53.0	53.0	50.6	50.6	50.6
53.4	51.9	53.5	51.7	51.8	52.6	52.6	51.9	51.9	51.9
AVG.									
ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9	ROLL#9	ROLL#9	ROLL#9
END	START	END	START	END	START	END	START	END	END
49.2	49.0	53.0	--	--	--	--	--	--	--
52.4	52.6	54.3	--	--	--	--	--	--	--
49.6	49.0	54.3	--	--	--	--	--	--	--
50.4	50.2	53.9	--	--	--	--	--	--	--
AVG.									
NASA LOT# 3 AVERAGE									51.5

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

2. Volatile Content, %
PTM-17B

				ROLL#1 <u>START</u>	ROLL#1 <u>END</u>	ROLL#2 <u>START</u>	ROLL#2 <u>END</u>
				4.3	3.8	4.3	3.9
				4.1	3.6	3.9	3.8
				<u>4.8</u>	<u>3.6</u>	<u>4.1</u>	<u>3.6</u>
			AVG.	4.4	3.7	4.1	3.8
	ROLL#3 <u>START</u>	ROLL#3 <u>END</u>	ROLL#4 <u>START</u>	ROLL#4 <u>END</u>	ROLL#5 <u>START</u>	ROLL#5 <u>END</u>	ROLL#6 <u>START</u>
	3.7	3.6	3.9	3.9	4.0	4.2	3.8
	3.5	3.5	3.4	3.7	3.7	3.5	3.6
	<u>3.7</u>	<u>3.6</u>	<u>4.0</u>	<u>3.8</u>	<u>3.8</u>	<u>3.5</u>	<u>3.6</u>
AVG.	3.6	3.6	3.8	3.8	3.8	3.7	3.7
	ROLL#6 <u>END</u>	ROLL#7 <u>START</u>	ROLL#7 <u>END</u>	ROLL#8 <u>START</u>	ROLL#8 <u>END</u>	ROLL#9 <u>START</u>	ROLL#9 <u>END</u>
	4.4	4.6	3.9	--	--	--	--
	3.9	3.8	3.8	--	--	--	--
	<u>3.9</u>	<u>3.8</u>	<u>3.7</u>	--	--	--	--
AVG.	4.1	4.1	3.8	--	--	--	--

NASA LOT# 3 AVERAGE 3.8

3. Flow, %
PTM-19G

				ROLL#1 <u>START</u>	ROLL#1 <u>END</u>	ROLL#2 <u>START</u>	ROLL#2 <u>END</u>
				19.5	16.3	18.9	15.6
				17.8	15.4	17.5	11.3
				<u>18.1</u>	<u>16.7</u>	<u>16.9</u>	<u>14.8</u>
			AVG.	18.5	16.1	17.8	13.9
	ROLL#3 <u>START</u>	ROLL#3 <u>END</u>	ROLL#4 <u>START</u>	ROLL#4 <u>END</u>	ROLL#5 <u>START</u>	ROLL#5 <u>END</u>	ROLL#6 <u>START</u>
	11.7	19.7	11.4	11.7	13.3	14.3	15.7
	15.0	16.2	10.5	12.3	13.6	14.3	15.1
	<u>14.1</u>	<u>17.0</u>	<u>12.0</u>	<u>11.8</u>	<u>14.0</u>	<u>13.8</u>	<u>15.2</u>
AVG.	13.6	17.6	11.3	11.9	13.6	14.1	15.3
	ROLL#6 <u>END</u>	ROLL#7 <u>START</u>	ROLL#7 <u>END</u>	ROLL#8 <u>START</u>	ROLL#8 <u>END</u>	ROLL#9 <u>START</u>	ROLL#9 <u>END</u>
	17.7	19.4	18.5	--	--	--	--
	17.8	17.2	19.7	--	--	--	--
	<u>17.5</u>	<u>16.8</u>	<u>19.5</u>	--	--	--	--
AVG.	17.7	17.8	19.2	--	--	--	--

NASA LOT# 3 AVERAGE 15.6

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

4. Resin Content, Dry Basis, %
PTM-16F, Type II

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				36.5	34.6	36.8	34.5
				35.4	33.7	34.2	34.1
				<u>36.5</u>	<u>34.9</u>	<u>36.1</u>	<u>33.5</u>
				36.1	34.4	35.7	34.0
AVG.							
				ROLL#4	ROLL#5	ROLL#5	ROLL#6
				START	END	END	START
				35.6	34.1	35.7	33.9
				31.9	31.7	32.0	33.6
				<u>37.0</u>	<u>34.6</u>	<u>35.7</u>	<u>34.8</u>
				34.8	33.5	34.5	34.1
AVG.							
				ROLL#6	ROLL#8	ROLL#8	ROLL#9
				END	START	END	END
				35.9	--	--	--
				32.9	--	--	--
				<u>35.8</u>	--	--	--
				34.9	--	--	--
AVG.							

NASA LOT# 3 AVERAGE 34.3

5. TACK, lbs
PTM-80

ROLL#1-S	32	ROLL#5-E	50
ROLL#1-E	50	ROLL#6-S	59
ROLL#2-S	56	ROLL#6-E	63
ROLL#2-E	28	ROLL#7-S	65
ROLL#3-S	45	ROLL#7-E	29
ROLL#3-E	54	ROLL#8-S	--
ROLL#4-S	40	ROLL#8-E	--
ROLL#4-E	41	ROLL#9-S	--
ROLL#5-S	45	ROLL#9-E	--
NASA LOT# 3 AVERAGE 47			

6. Gel Time, Seconds
PTM-20E

ROLL#1-S	63	ROLL#5-E	42
ROLL#1-E	95	ROLL#6-S	56
ROLL#2-S	61	ROLL#6-E	36
ROLL#2-E	38	ROLL#7-S	40
ROLL#3-S	55	ROLL#7-E	35
ROLL#3-E	50	ROLL#8-S	--
ROLL#4-S	44	ROLL#8-E	--
ROLL#4-E	32	ROLL#9-S	--
ROLL#5-S	49	ROLL#9-E	--
NASA LOT# 3 AVERAGE 50			

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

7a. Atomic Absorption, ppm CTM-53B		ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END	ROLL#3 START
Na		344	438	436	428	276
K		19	17	20	20	16
Ca		2	2	2	2	2
Mg		2	2	2	3	2
Li		0	0	0	0	0
TOTAL		367	459	460	453	296

	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START	ROLL#6 END
Na	309	399	456	454	382	500	494
K	15	17	14	15	18	20	21
Ca	3	3	2	2	2	2	2
Mg	1	1	1	2	2	1	3
Li	0	0	0	0	0	0	0
TOTAL	328	420	473	473	404	523	520

	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END	LOT#3 AVG.
Na	533	288	--	--	--	--	410
K	22	18	--	--	--	--	18
Ca	2	2	--	--	--	--	2
Mg	2	2	--	--	--	--	2
Li	0	0	--	--	--	--	0
TOTAL	559	310	--	--	--	--	432

7b. Moisture Content, %
CTM-53B

ROLL#1-S	5.22	ROLL#5-E	5.03
ROLL#1-E	5.19	ROLL#6-S	5.24
ROLL#2-S	5.13	ROLL#6-E	5.42
ROLL#2-E	5.48	ROLL#7-S	5.34
ROLL#3-S	5.05	ROLL#7-E	5.21
ROLL#3-E	4.99	ROLL#8-S	----
ROLL#4-S	5.06	ROLL#8-E	----
ROLL#4-E	4.86	ROLL#9-S	----
ROLL#5-S	5.12	ROLL#9-E	----
NASA LOT# 3 AVERAGE			5.17

7c. Ash Content, %
CTM-53B

ROLL#1-S	.16	ROLL#5-E	.17
ROLL#1-E	.11	ROLL#6-S	.20
ROLL#2-S	.07	ROLL#6-E	.31
ROLL#2-E	.12	ROLL#7-S	.26
ROLL#3-S	.21	ROLL#7-E	.23
ROLL#3-E	.12	ROLL#8-S	---
ROLL#4-S	.15	ROLL#8-E	---
ROLL#4-E	.19	ROLL#9-S	---
ROLL#5-S	.18	ROLL#9-E	---
NASA LOT# 3 AVERAGE			.18

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

8. TGA, % weight loss at 500°C
CTM-51 (Nitrogen)

ROLL#1-S	10.9	ROLL#5-E	5.9
ROLL#1-E	9.7	ROLL#6-S	8.9
ROLL#2-S	9.6	ROLL#6-E	10.1
ROLL#2-E	9.4	ROLL#7-S	10.3
ROLL#3-S	9.1	ROLL#7-E	11.1
ROLL#3-E	9.5	ROLL#8-S	---
ROLL#4-S	10.4	ROLL#8-E	---
ROLL#4-E	9.5	ROLL#9-S	---
ROLL#5-S	10.1	ROLL#9-E	---
NASA LOT# 3 AVERAGE			9.6

See chart 8A-8N

9. DSC, °C
CTM-50A

	<u>FIRST TEMPERATURE</u>	<u>SECOND TEMPERATURE</u>
ROLL#1-S	180	233
ROLL#1-E	175	235
ROLL#2-S	177	232
ROLL#2-E	179	236
ROLL#3-S	176	237
ROLL#3-E	174	234
ROLL#4-S	179	237
ROLL#4-E	178	238
ROLL#5-S	178	236
ROLL#5-E	179	235
ROLL#6-S	179	234
ROLL#6-E	178	235
ROLL#7-S	178	235
ROLL#7-E	178	---
ROLL#8-S	---	---
ROLL#8-E	---	---
ROLL#9-S	---	---
ROLL#9-E	---	235
NASA LOT# 3 AVERAGE		178

See chart 9A-9N

10. Infrared (IRZB) Baseline
CTM-21C

ROLL#1-S	1.13	ROLL#5-E	1.08
ROLL#1-E	1.13	ROLL#6-S	1.11
ROLL#2-S	1.13	ROLL#6-E	1.10
ROLL#2-E	1.07	ROLL#7-S	1.15
ROLL#3-S	1.11	ROLL#7-E	1.14
ROLL#3-E	1.11	ROLL#8-S	----
ROLL#4-S	1.11	ROLL#8-E	----
ROLL#4-E	1.10	ROLL#9-S	----
ROLL#5-S	1.11	ROLL#9-E	----
NASA LOT# 3 AVERAGE			1.11

See chart 10A-10N

11. Environmental History

Date manufactured: 30 April 1986
 Package in: Polyethylene bag supported
 in cardboard carton
 Date shipped: 12 June 1986 in
 40°F truck

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

12. Specific Gravity, Cured, Units
ASTM D792

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				1.471	1.464	1.484	1.398
				1.479	1.462	1.483	1.446
				<u>1.480</u>	<u>1.409</u>	<u>1.481</u>	<u>1.418</u>
				1.477	1.445	1.483	1.421
AVG.							
				ROLL#4	ROLL#5	ROLL#5	ROLL#6
				START	END	END	START
				1.478	1.483	1.483	1.480
				1.480	1.484	1.481	1.481
				<u>1.479</u>	<u>1.484</u>	<u>1.471</u>	<u>1.483</u>
				1.479	1.484	1.478	1.481
AVG.							
				ROLL#6	ROLL#8	ROLL#9	ROLL#9
				END	END	START	END
				1.486	--	--	--
				1.486	--	--	--
				<u>1.487</u>	--	--	--
AVG.				1.486	--	--	--

NASA LOT# 3 AVERAGE 1.473

13a. Tensile Strength, ksi, WARP
FTMS 406-1011

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				20.05	20.34	20.11	22.63
				20.81	21.50	19.18	23.47
				21.29	20.73	17.67	22.97
				19.48	21.35	19.93	21.13
				<u>22.40</u>	<u>20.22</u>	<u>20.13</u>	<u>23.34</u>
				20.80	20.83	19.41	22.71
AVG.							
				ROLL#4	ROLL#5	ROLL#5	ROLL#6
				START	END	END	START
				19.34	20.36	20.85	22.15
				21.16	20.19	21.13	22.49
				21.48	19.93	19.62	22.67
				20.97	21.02	19.37	22.56
				<u>21.32</u>	<u>21.75</u>	<u>18.37</u>	<u>22.77</u>
				20.85	20.65	19.87	22.53
AVG.							
				ROLL#7	ROLL#8	ROLL#9	ROLL#9
				END	END	START	END
				21.24	--	--	--
				20.45	--	--	--
				21.13	--	--	--
				18.53	--	--	--
				<u>21.51</u>	--	--	--
				20.57	--	--	--
AVG.							

NASA LOT# 3 AVERAGE 21.21

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

13b. Tensile Modulus, msi , WARP
FTMS 406-1011

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				2.86	3.18	3.00	3.17
				2.82	3.06	2.86	3.26
				3.04	3.06	2.98	3.29
				3.07	3.13	3.12	3.14
				<u>2.96</u>	<u>3.45</u>	<u>2.87</u>	<u>3.21</u>
				2.95	3.18	2.97	3.21
AVG.							
ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6	ROLL#6
START	END	START	END	START	END	START	END
2.91	3.07	3.01	2.98	2.65	2.96	3.08	2.98
2.85	3.02	3.06	3.07	2.88	--	2.98	3.20
3.03	3.04	3.07	3.08	3.06	2.89	3.19	3.19
3.00	3.09	3.12	2.87	2.92	2.95	3.27	3.27
<u>2.97</u>	<u>3.02</u>	<u>3.09</u>	<u>3.11</u>	<u>2.90</u>	<u>2.78</u>	<u>3.14</u>	<u>3.14</u>
2.95	3.05	3.07	3.02	2.88	2.90		
AVG.							
ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9	ROLL#9
END	START	END	START	END	START	END	END
3.07	3.45	2.98	--	--	--	--	--
2.82	3.02	3.22	--	--	--	--	--
2.76	3.24	3.24	--	--	--	--	--
3.14	2.88	3.01	--	--	--	--	--
<u>3.00</u>	<u>3.30</u>	<u>3.15</u>	--	--	--	--	--
2.96	3.18	3.12	--	--	--	--	--
AVG.							

NASA LOT# 3 AVERAGE 3.04

13c. Tensile Elongation, %, WARP
FTMS 406-1011

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				1.05	.98	1.04	1.10
				1.14	1.05	1.02	1.13
				1.13	1.01	.97	1.12
				1.00	1.01	--	1.05
				<u>1.27</u>	<u>.91</u>	<u>1.08</u>	<u>1.16</u>
				1.12	.99	1.03	1.11
AVG.							
ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6	ROLL#6
START	END	START	END	START	END	START	END
.92	1.40	1.09	.93	1.08	1.11	1.19	1.20
1.05	1.33	1.17	1.08	1.11	--	1.15	1.15
.97	1.18	1.16	1.04	1.04	1.12	1.16	1.16
1.05	1.20	1.12	1.05	1.13	1.04	1.14	1.14
<u>1.12</u>	<u>1.21</u>	<u>1.14</u>	<u>1.05</u>	<u>1.15</u>	<u>1.01</u>	<u>1.17</u>	<u>1.17</u>
1.02	1.26	1.14	1.03	1.10	1.07		
AVG.							

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

13c. Tensile Elongation, %, WARP (CONTINUED)
FTMS 406-1011

ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
1.13	1.03	1.07	--	--	--	--
1.17	1.14	1.02	--	--	--	--
1.09	1.14	1.04	--	--	--	--
.96	1.13	.96	--	--	--	--
<u>1.15</u>	<u>1.16</u>	<u>1.11</u>	--	--	--	--
AVG. 1.10	1.12	1.04	--	--	--	--

NASA LOT# 3 AVERAGE 1.09

14a. Flexural Strength, ksi, WARP
FTMS 406-1031

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
36.08	36.71	33.49	40.68
35.98	34.90	27.46	36.14
36.75	33.06	33.09	39.13
36.95	41.06	34.58	39.00
<u>37.68</u>	<u>42.95</u>	<u>34.37</u>	<u>36.58</u>
AVG. 36.69	37.73	32.60	38.30

ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
35.36	40.63	34.48	35.38	31.74	29.50	35.52
34.27	44.99	35.69	33.44	35.62	29.70	33.49
33.85	40.27	32.21	33.79	38.83	32.36	34.20
37.60	39.47	32.70	32.90	39.58	35.57	34.03
<u>36.29</u>	<u>40.14</u>	<u>34.42</u>	<u>34.07</u>	<u>36.80</u>	<u>29.64</u>	<u>33.66</u>
AVG. 35.47	41.10	33.90	33.91	36.51	31.35	34.18

ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
30.63	29.66	33.66	--	--	--	--
34.28	34.41	29.79	--	--	--	--
37.18	31.99	37.29	--	--	--	--
38.36	27.22	34.08	--	--	--	--
<u>33.43</u>	<u>31.09</u>	<u>34.94</u>	--	--	--	--
AVG. 34.78	30.87	33.95	--	--	--	--

NASA LOT# 3 AVERAGE 35.10

14b. Flexural Modulus, ksi, WARP
FTMS 406-1031

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
2.68	2.82	2.61	2.69
2.50	2.80	2.70	2.68
2.84	2.89	2.61	2.81
2.99	2.73	2.66	2.84
<u>2.58</u>	<u>3.11</u>	<u>2.71</u>	<u>2.81</u>
AVG. 2.72	2.87	2.66	2.77

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

14b. Flexural Modulus, ksi, WARP (CONTINUED)
FTMS 406-1031

	ROLL#3 START	ROLL#3 END	ROLL#4 START	ROLL#4 END	ROLL#5 START	ROLL#5 END	ROLL#6 START
	2.84	2.92	2.60	2.43	3.06	2.82	2.31
	2.68	2.81	2.42	2.78	3.17	2.98	2.61
	2.57	2.84	2.66	2.76	3.09	2.21	2.54
	2.72	2.70	2.47	2.59	3.35	2.32	2.73
	<u>2.90</u>	<u>2.83</u>	<u>2.74</u>	<u>2.58</u>	<u>3.27</u>	<u>2.72</u>	<u>2.71</u>
AVG.	2.74	2.82	2.58	2.63	3.19	2.61	2.58
	ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
	2.86	2.75	1.93	--	--	--	--
	2.73	2.87	2.57	--	--	--	--
	2.64	2.71	2.94	--	--	--	--
	2.82	2.32	2.75	--	--	--	--
	<u>2.47</u>	<u>2.69</u>	<u>2.84</u>	--	--	--	--
AVG.	2.70	2.67	2.61	--	--	--	--

NASA LOT# 3 AVERAGE 2.72

15a. Compressive Strength, ksi, WARP
FTMS 406-1021

Compressive Strength,ksi, WARP FTMS 406-1021				ROLL#1 <u>START</u> 62.60 61.55 59.06 60.74 <u>57.41</u> 60.27	ROLL#1 <u>END</u> 48.73 64.07 63.42 64.43 <u>58.27</u> 59.78	ROLL#2 <u>START</u> 51.96 61.36 57.80 63.24 <u>62.74</u> 59.42	ROLL#2 <u>END</u> 59.70 62.56 58.95 57.13 <u>55.63</u> 58.79
AVG.							
ROLL#3 <u>START</u> 60.25 52.48 43.92 59.52 <u>61.08</u> 55.45	ROLL#3 <u>END</u> 51.89 52.59 64.72 63.44 <u>62.13</u> 58.95	ROLL#4 <u>START</u> 48.83 60.64 54.38 66.11 <u>67.95</u> 59.58	ROLL#4 <u>END</u> 59.23 63.44 61.55 60.69 <u>53.50</u> 59.68	ROLL#5 <u>START</u> 51.62 58.09 53.18 54.76 <u>48.54</u> 53.24	ROLL#5 <u>END</u> 52.12 56.05 50.77 61.83 <u>59.22</u> 56.00	ROLL#6 <u>START</u> 51.74 55.25 46.50 46.53 <u>53.16</u> 50.63	
AVG.							
ROLL#6 <u>END</u> 56.89 49.98 54.63 49.56 <u>56.00</u> 53.41	ROLL#7 <u>START</u> 56.95 62.30 52.83 56.31 <u>54.49</u> 56.58	ROLL#7 <u>END</u> 54.21 56.45 59.29 54.85 <u>54.60</u> 55.88	ROLL#8 <u>START</u> -- -- -- -- -- --	ROLL#8 <u>END</u> -- -- -- -- -- --	ROLL#9 <u>START</u> -- -- -- -- -- --	ROLL#9 <u>END</u> -- -- -- -- -- --	
AVG.							
				AVERAGE 56.98			

NASA LOT# 3 AVERAGE 56.98

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

15b. Compressive, Modulus, ksi, WARP
FTMS 406-1021

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				3.19	3.07	3.00	3.22
				3.25	3.12	3.07	3.09
				2.78	3.06	3.13	--
				3.37	3.09	3.19	2.98
				<u>3.05</u>	<u>3.08</u>	<u>3.38</u>	<u>3.04</u>
				3.13	3.08	3.15	3.08
AVG.							
ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6	ROLL#6
START	END	START	END	START	END	START	END
3.20	2.97	2.99	3.16	3.42	3.07	3.14	
3.08	2.90	2.96	3.20	3.38	3.32	3.23	
2.94	2.90	3.01	3.15	3.46	3.05	3.03	
3.13	2.94	3.06	3.11	3.31	3.09	3.04	
<u>3.24</u>	<u>2.92</u>	<u>3.47</u>	<u>3.05</u>	<u>3.37</u>	<u>3.02</u>	<u>3.03</u>	
3.12	2.93	3.10	3.13	3.39	3.11	3.09	
AVG.							
ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9	
END	START	END	START	END	START	END	
3.24	3.07	3.06	--	--	--	--	
3.33	3.21	3.15	--	--	--	--	
3.11	3.10	3.36	--	--	--	--	
3.06	3.12	3.09	--	--	--	--	
<u>3.12</u>	<u>3.09</u>	<u>3.14</u>	--	--	--	--	
3.17	3.12	3.16	--	--	--	--	
AVG.							

NASA LOT# 3 AVERAGE 3.13

16. Double Shear Strength, ksi
FTMS 406-1041A

				ROLL#1	ROLL#1	ROLL#2	ROLL#2
				START	END	START	END
				5.09	6.26	4.57	4.15
				6.15	6.53	3.98	5.05
				5.36	5.77	4.80	5.08
				5.97	6.09	4.72	4.42
				<u>4.32</u>	<u>6.15</u>	<u>4.36</u>	<u>4.49</u>
				5.38	6.16	4.49	4.64
AVG.							
ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6	ROLL#6
START	END	START	END	START	END	START	END
5.74	4.86	4.35	4.32	5.86	5.35	5.23	
5.66	3.51	4.87	4.56	4.51	4.66	4.85	
4.71	4.72	4.94	4.48	4.90	5.05	5.00	
5.54	4.77	4.56	4.26	5.23	4.83	4.82	
<u>5.00</u>	<u>4.15</u>	<u>5.77</u>	<u>4.34</u>	<u>5.65</u>	<u>5.28</u>	<u>4.76</u>	
5.33	4.40	4.90	4.39	5.23	5.03	4.93	
AVG.							

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

16. Double Shear Strength, ksi (CONTINUED)
FTMS 406-1041A

ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9
END	START	END	START	END	START	END
4.82	5.69	5.56	--	--	--	--
5.89	5.66	4.75	--	--	--	--
4.51	4.13	4.59	--	--	--	--
5.35	4.64	4.79	--	--	--	--
<u>5.65</u>	<u>4.19</u>	<u>5.53</u>	--	--	--	--
AVG. 5.24	4.86	5.04	--	--	--	--

NASA LOT# 3 AVERAGE 5.00

17. Barcol Hardness, Units
ASTM D-2583
(Average of 10
determinations)

ROLL#1-S	72.0	ROLL#5-E	74.6
ROLL#1-E	75.0	ROLL#6-S	73.7
ROLL#2-S	72.9	ROLL#6-E	73.3
ROLL#2-E	70.4	ROLL#7-S	74.0
ROLL#3-S	71.0	ROLL#7-E	73.0
ROLL#3-E	73.0	ROLL#8-S	--
ROLL#4-S	72.0	ROLL#8-E	--
ROLL#4-E	73.0	ROLL#9-S	--
ROLL#5-S	71.2	ROLL#9-E	--

NASA LOT# 3 AVERAGE 72.8

18. Residual Volatiles, %
PTH-98

ROLL#1	ROLL#1	ROLL#2	ROLL#2
START	END	START	END
1.66	2.00	2.16	1.57
1.66	1.95	2.16	1.60
<u>1.67</u>	<u>1.96</u>	<u>2.15</u>	<u>1.59</u>
AVG. 1.66	1.97	2.16	1.58

ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6
END	START	END	START	END	START	END
1.78	1.93	1.99	1.50	2.03	1.92	1.68
1.81	1.88	2.00	1.52	1.99	1.83	1.63
<u>1.75</u>	<u>1.90</u>	<u>1.97</u>	<u>1.52</u>	<u>1.98</u>	<u>1.81</u>	<u>1.63</u>
AVG. 1.78	1.90	1.99	1.52	2.00	1.85	1.64

ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9
END	START	END	START	END	START	END
1.74	1.96	1.85	--	--	--	--
1.78	1.97	1.98	--	--	--	--
<u>1.69</u>	<u>1.97</u>	<u>1.89</u>	--	--	--	--
AVG. 1.74	1.97	1.91	--	--	--	--

NASA LOT# 3 AVERAGE 1.83

19. Resin Content, Pyrolysis, %
CTM-14B

ROLL#1	ROLL#1	ROLL#2	ROLL#2
START	END	START	END
33.99	32.31	34.63	32.32
34.39	32.61	33.77	32.51
<u>34.76</u>	<u>32.99</u>	<u>35.23</u>	<u>31.80</u>
AVG. 34.38	32.63	34.54	32.21

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

19. Resin Content, Pyrolysis, % (CONTINUED)
CTM-14B

ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
34.37	33.97	32.82	32.55	38.30	33.35	35.07
35.43	34.28	33.11	31.95	33.77	34.08	34.38
<u>33.90</u>	<u>33.65</u>	<u>31.73</u>	<u>32.64</u>	<u>33.52</u>	<u>34.57</u>	<u>35.74</u>
AVG. 34.57	33.97	32.55	32.38	35.20	34.00	35.06

ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
34.44	35.86	34.04	--	--	--	--
34.28	36.49	34.49	--	--	--	--
<u>34.66</u>	<u>36.73</u>	<u>34.25</u>	--	--	--	--
AVG. 34.46	36.36	34.26	--	--	--	--

NASA LOT# 3 AVERAGE 34.04

20. Acetone Extraction, %
CTM-18A

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
2.56	.99	.25	1.43
.76	.08	-1.85	1.59
<u>1.90</u>	<u>1.74</u>	<u>.99</u>	<u>1.28</u>
AVG. 1.74	.88	-.20	1.43

ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
.33	.94	1.23	2.44	1.50	1.89	-.46
.16	2.46	1.32	-.60	1.81	1.55	-5.36
<u>1.10</u>	<u>.33</u>	<u>1.58</u>	<u>.90</u>	<u>2.35</u>	<u>1.80</u>	<u>1.71</u>
AVG. .53	1.24	1.38	.91	1.89	1.75	-1.37

ROLL#6 END	ROLL#7 START	ROLL#7 END	ROLL#8 START	ROLL#8 END	ROLL#9 START	ROLL#9 END
-6.57	-6.47	-11.20	--	--	--	--
.05	-6.84	-6.84	--	--	--	--
<u>1.47</u>	<u>-4.12</u>	<u>-6.83</u>	--	--	--	--
AVG. -1.69	-5.81	-8.29	--	--	--	--

NASA LOT # 3 AVERAGE -.40

21a. CTE, in/in °F, with PLY
PTM-61B

ROLL#1 START	ROLL#1 END	ROLL#2 START	ROLL#2 END
5.09	5.07	5.28	5.74
<u>4.91</u>	<u>5.68</u>	<u>5.74</u>	<u>5.30</u>
AVG. 5.00	5.38	5.51	5.52

ROLL#3 END	ROLL#3 START	ROLL#4 END	ROLL#4 START	ROLL#5 END	ROLL#5 START	ROLL#6 END
3.64	3.98	4.79	3.36	4.31	4.80	5.76
<u>4.86</u>	<u>5.55</u>	<u>5.67</u>	<u>5.34</u>	<u>5.43</u>	<u>5.76</u>	<u>6.49</u>
AVG. 4.25	4.77	5.23	4.32	4.87	5.28	6.13

FM 5055B NASA LOT# 3 U.S.P. LOT# C02133

21a. CTE, in/in °F, with PLY (CONTINUED)
PTM-61B

	ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9
	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>
	4.58	5.36	3.90	--	--	--	--
	<u>5.36</u>	<u>5.90</u>	<u>5.05</u>	--	--	--	--
AVG.	4.97	5.63	4.48	--	--	--	--

NASA LOT#3 AVERAGE 5.09

21b. CTE, in/in °F, Crossply
PTM-61B

		ROLL#1	ROLL#1	ROLL#2	ROLL#2
		<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>
		7.05	9.01	6.95	6.48
		<u>5.45</u>	<u>9.08</u>	<u>7.72</u>	<u>8.42</u>
	AVG.	6.25	9.05	7.34	7.45

	ROLL#3	ROLL#3	ROLL#4	ROLL#4	ROLL#5	ROLL#5	ROLL#6
	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>
	4.86	7.48	6.89	7.43	8.20	8.48	11.10
	<u>7.72</u>	<u>8.82</u>	<u>8.75</u>	<u>5.88</u>	<u>6.68</u>	<u>7.12</u>	<u>10.58</u>
AVG.	6.29	8.15	7.82	6.66	7.44	7.80	10.84

	ROLL#6	ROLL#7	ROLL#7	ROLL#8	ROLL#8	ROLL#9	ROLL#9
	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>	<u>START</u>	<u>END</u>
	10.08	9.08	8.48	--	--	--	--
	<u>7.52</u>	<u>9.01</u>	<u>9.02</u>	--	--	--	--
AVG.	8.80	9.05	8.75	--	--	--	--

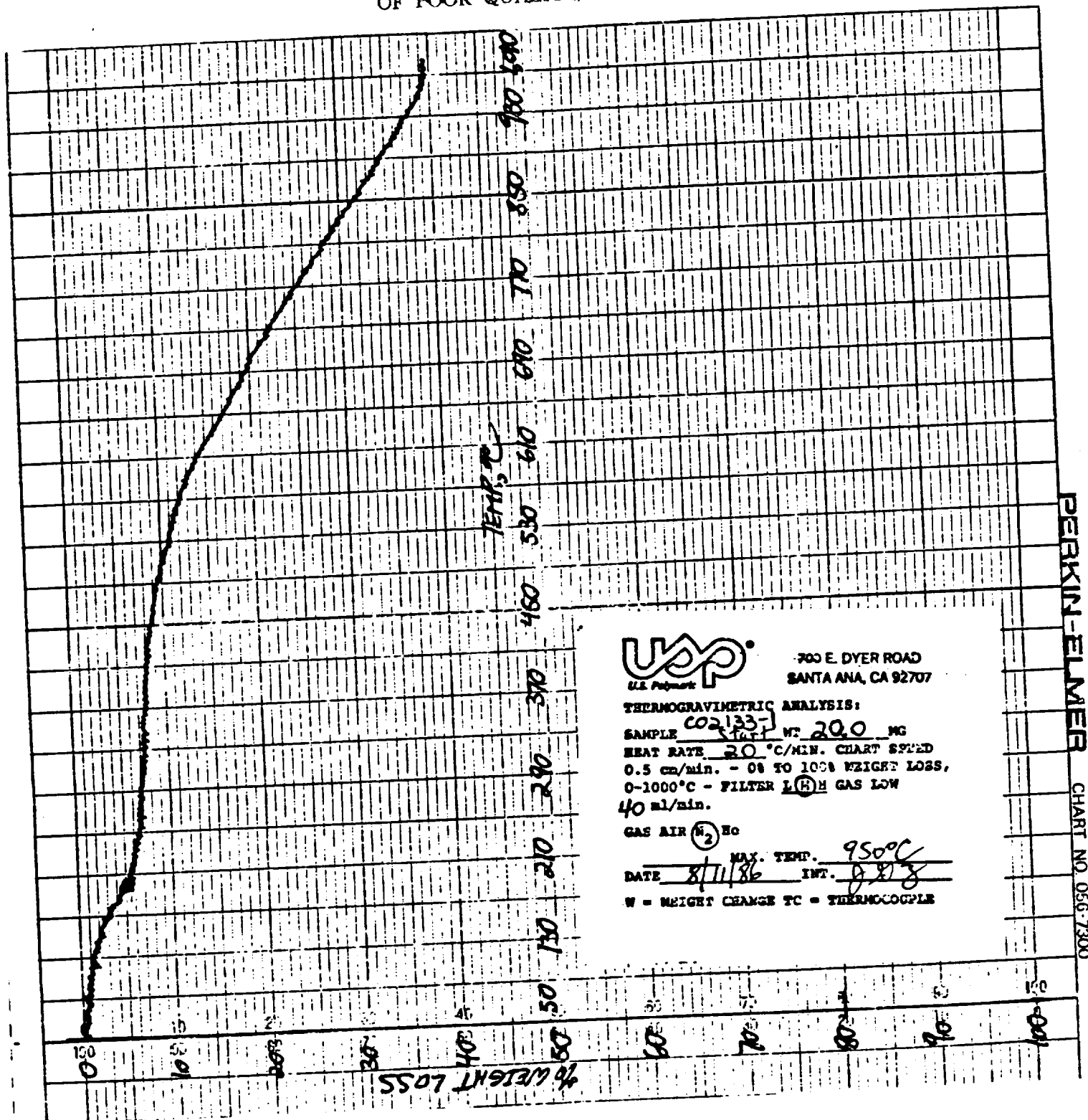
NASA LOT# 3 AVERAGE 7.98

See chart 21A-21N

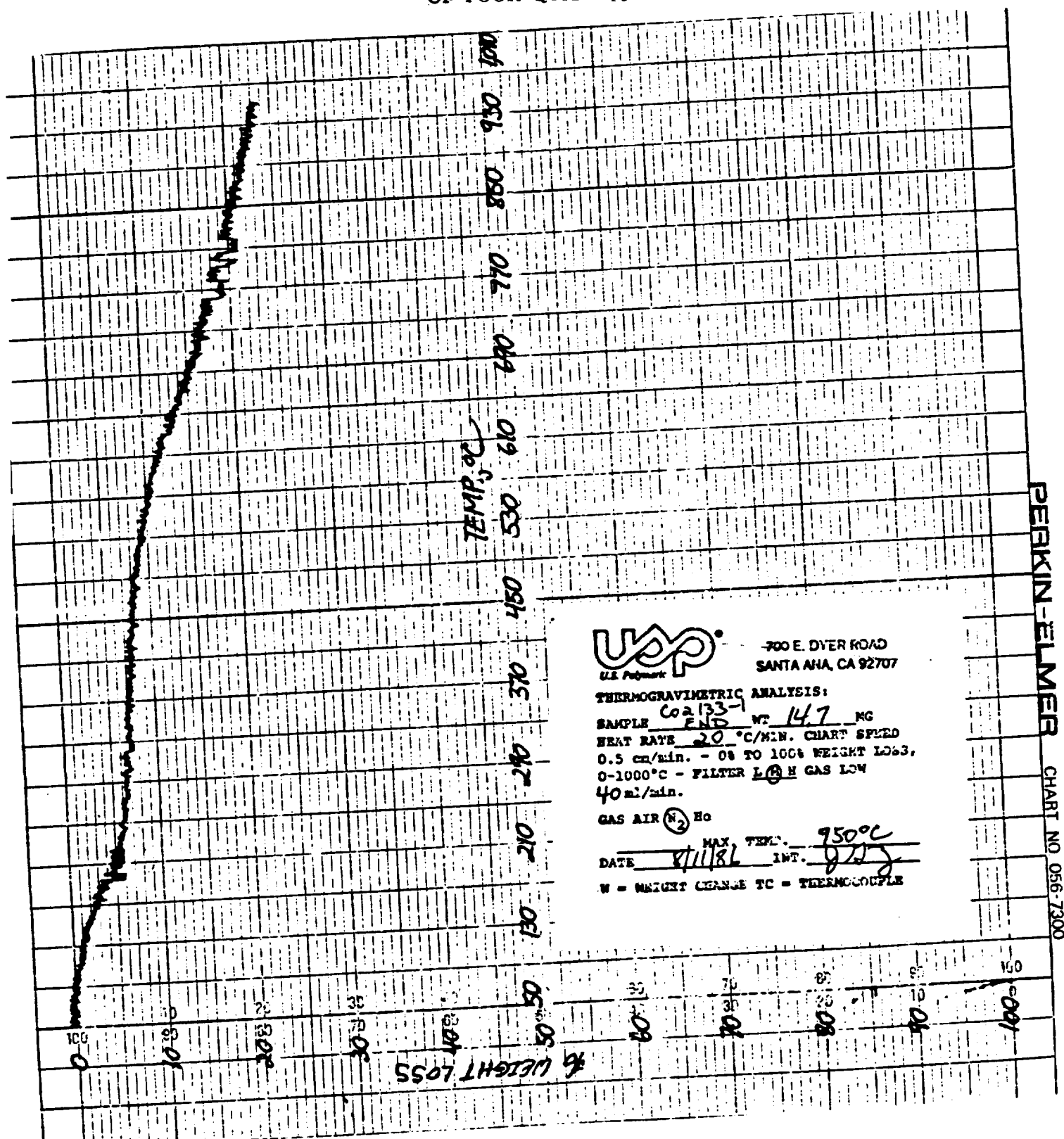
U.S. Polymeric

Hamid M. Quraishi
Hamid M. Quraishi, Manager
Quality Assurance Department

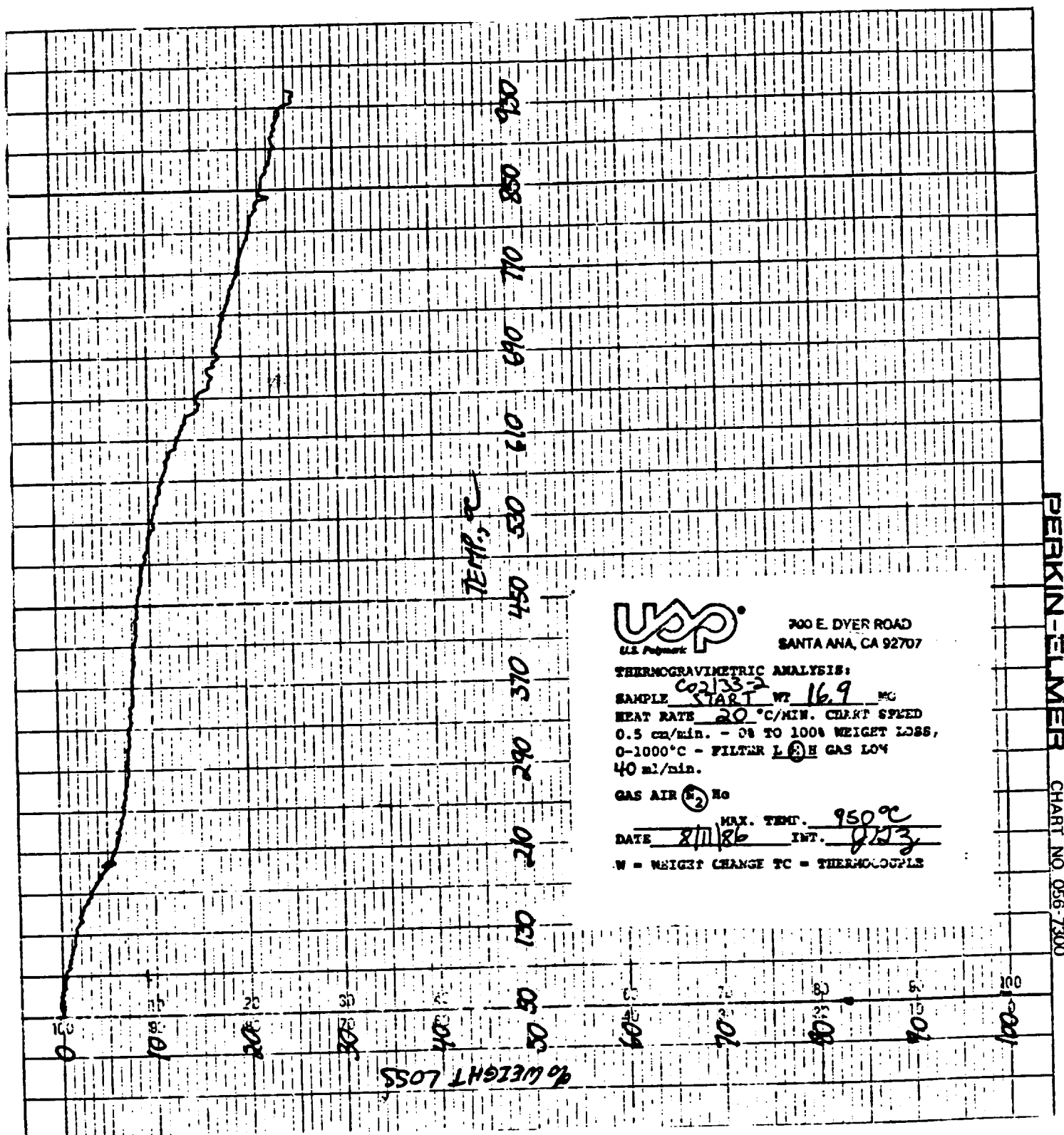
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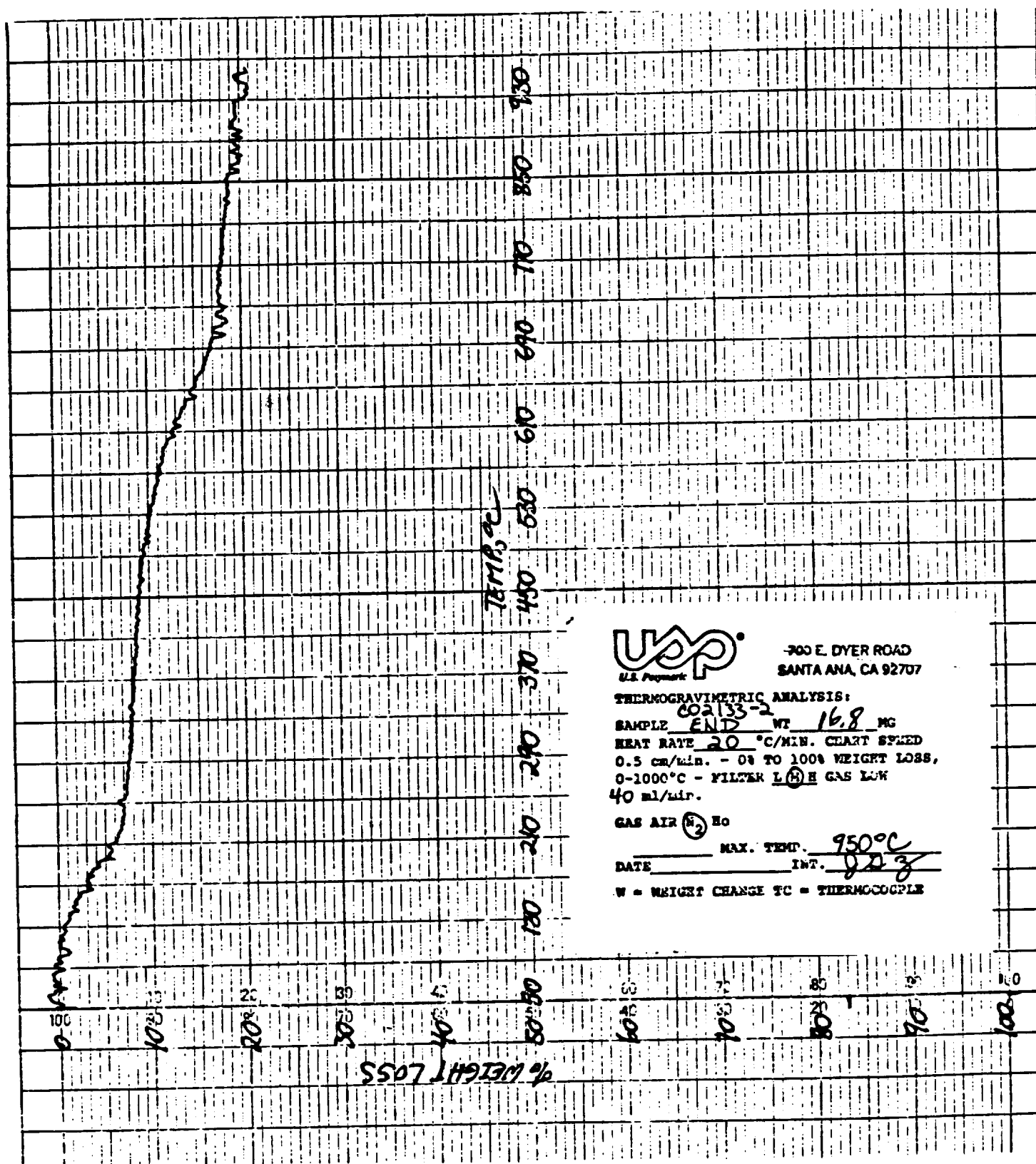
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700 E. DYER ROAD
SANTA ANA, CA 92707

THERMOGRAVIMETRIC ANALYSIS:

SAMPLE CO2133-2 WT 16.8 MG
HEAT RATE 20 °C/MIN. CHART SPEED
0.5 cm/min. - 0% TO 100% WEIGHT LOSS,
0-1000°C - FILTER L (H) GAS LW
40 ml/min.

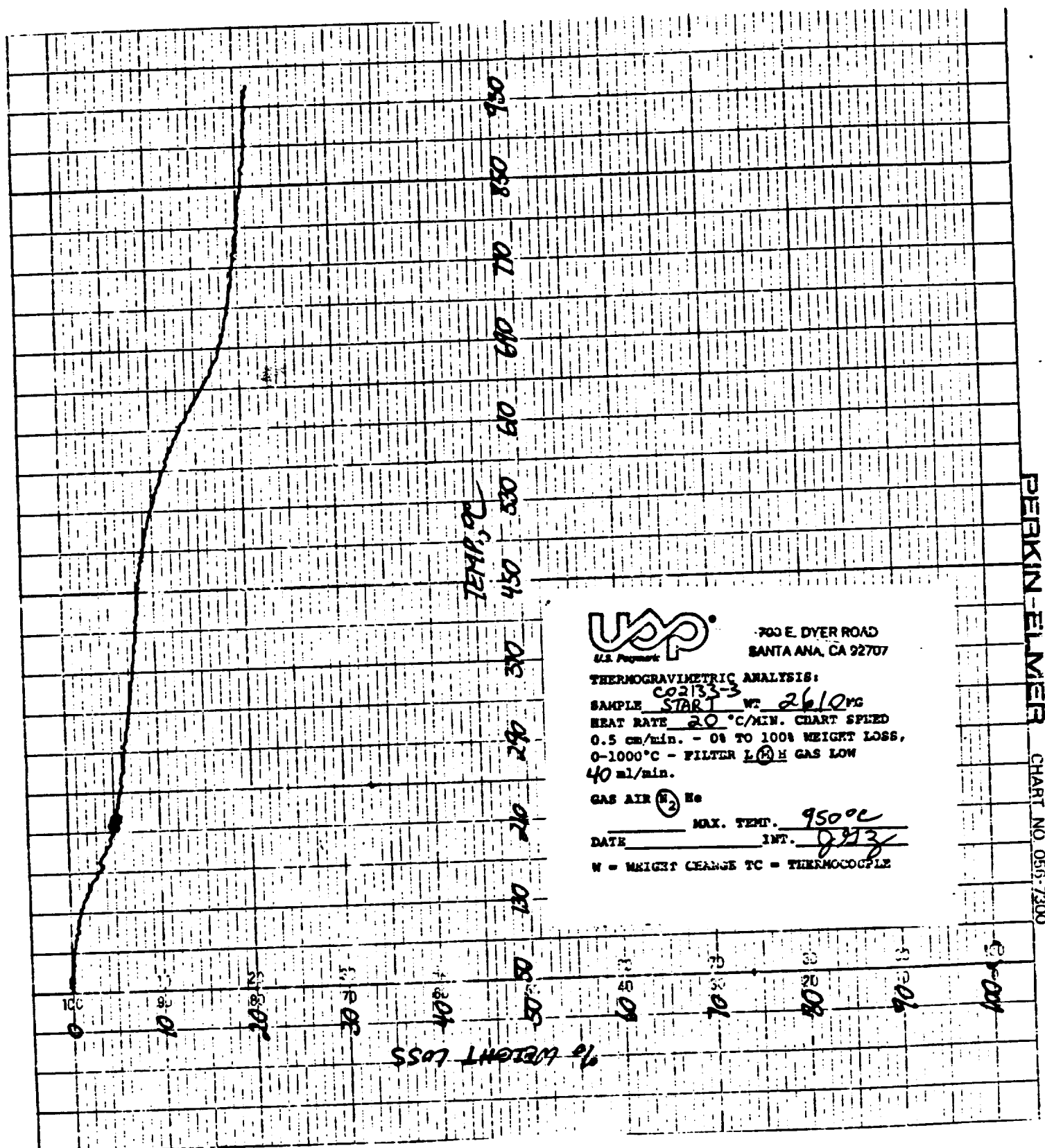
GAS AIR (N₂) Eo

MAX. TEMP. 950°C
DATE _____ INT. 023

W = WEIGHT CHANGE TC = THERMOCOUPLE

PERKIN-ELMER CHART NO. 056-7300

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703 E. DYER ROAD
SANTA ANA, CA 92707

THERMOGRAVIMETRIC ANALYSIS:

SAMPLE CO2133-3 WT. 2610mg
HEAT RATE 20 °C/MIN. CHART SPEED
0.5 cm/min. - 0% TO 100% WEIGHT LOSS,
0-1000°C - FILTER LH GAS LOW
40 ml/min.

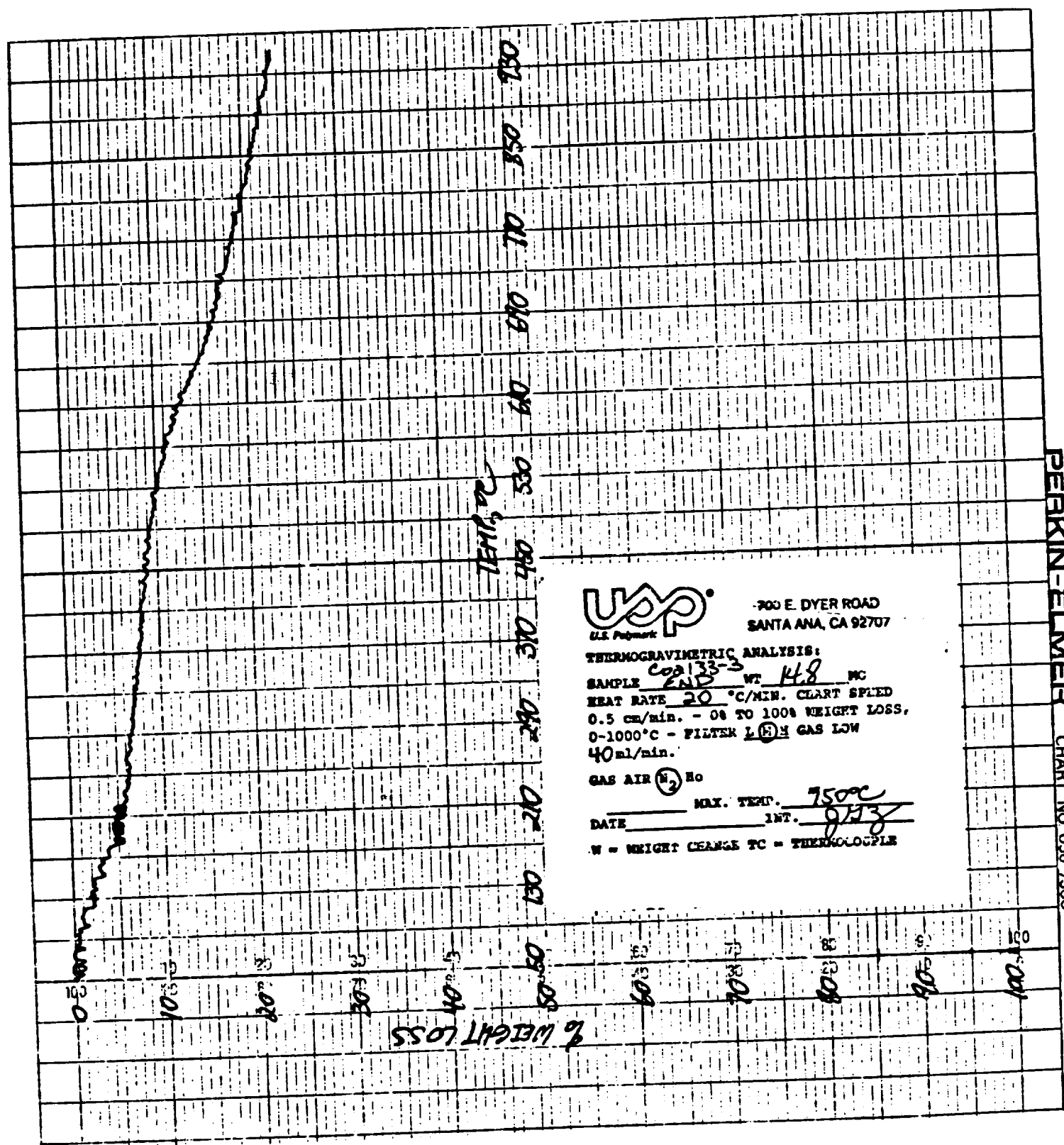
GAS AIR (N₂) He

MAX. TEMP. 950°C
DATE 8/13 INT. 8/13

W = WEIGHT CHANGE TC = THERMOCOUPLE

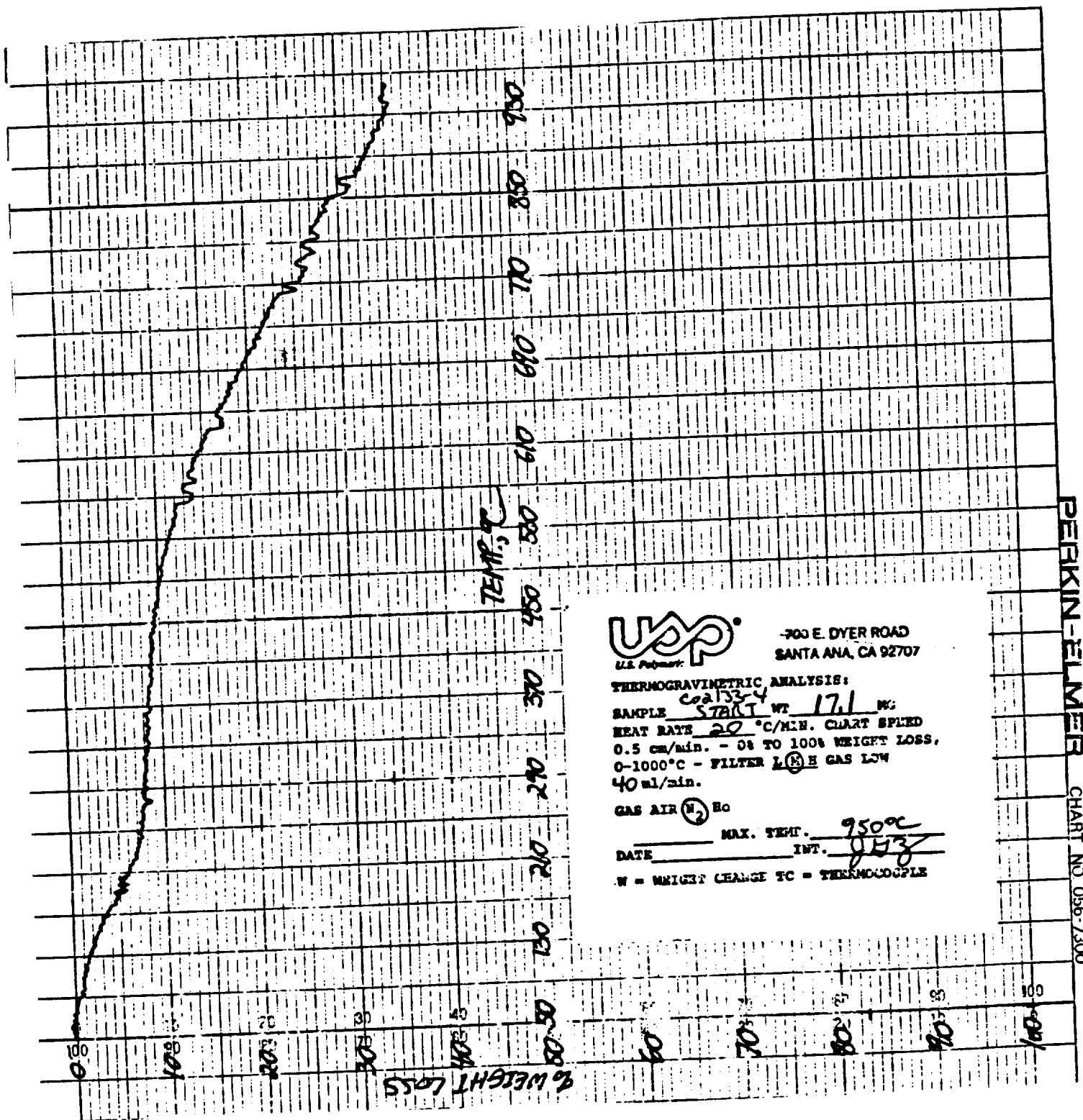
PERKIN-ELMER CHART NO. 055-7300

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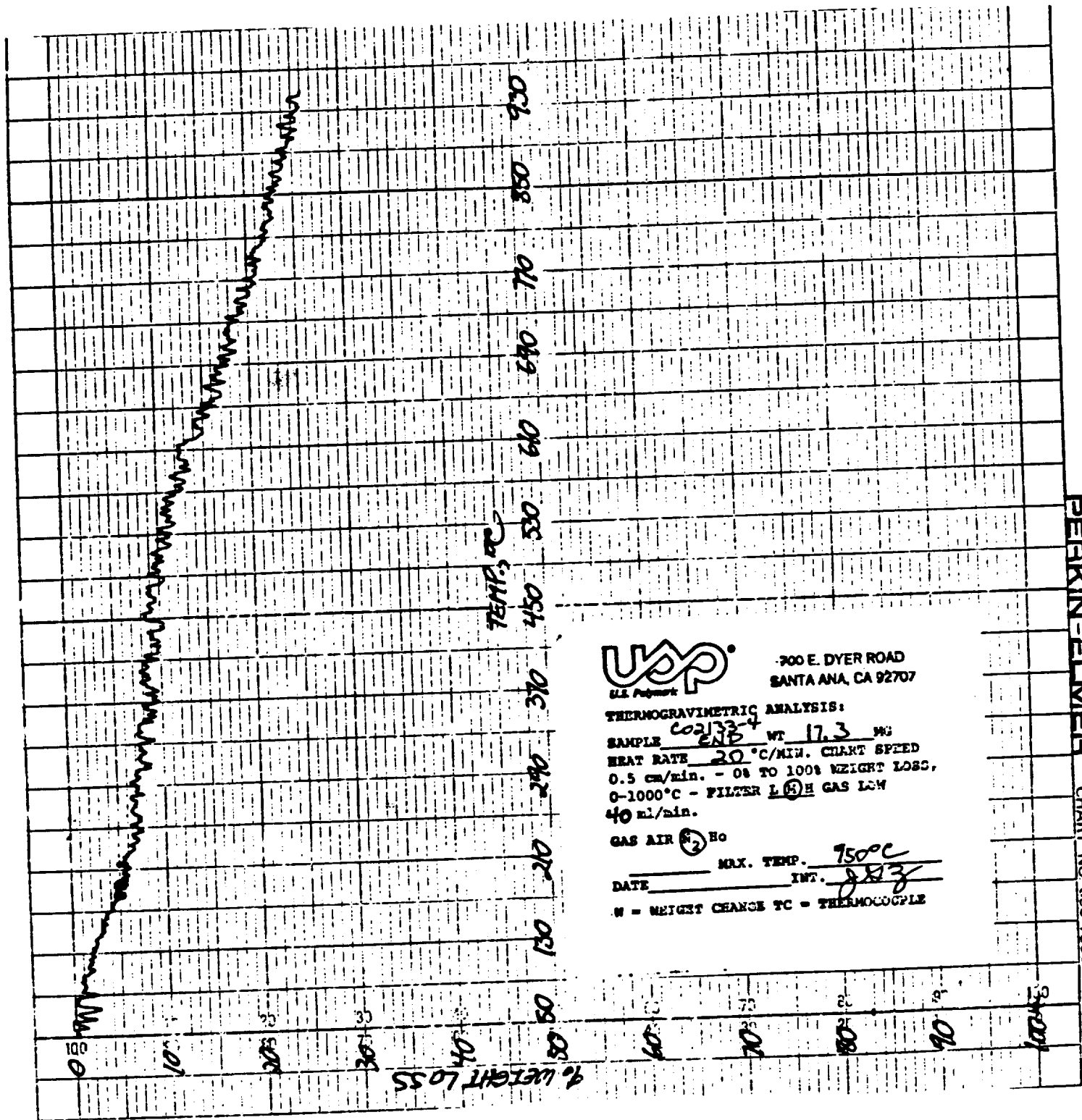


PERKIN-ELMER CHART NO 056-7300

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900 E. DYER ROAD
SANTA ANA, CA 92707

HERMOGRAVIMETRIC ANALYSIS:

SAMPLE CO2/33-4 WT 17.3 MG
HEAT RATE 20 °C/MIN. CHART SPEED
0.5 cm/min. - 0% TO 100% WEIGHT LOSS,
0-1000°C - FILTER L6H GAS LOW
40 ml/min.

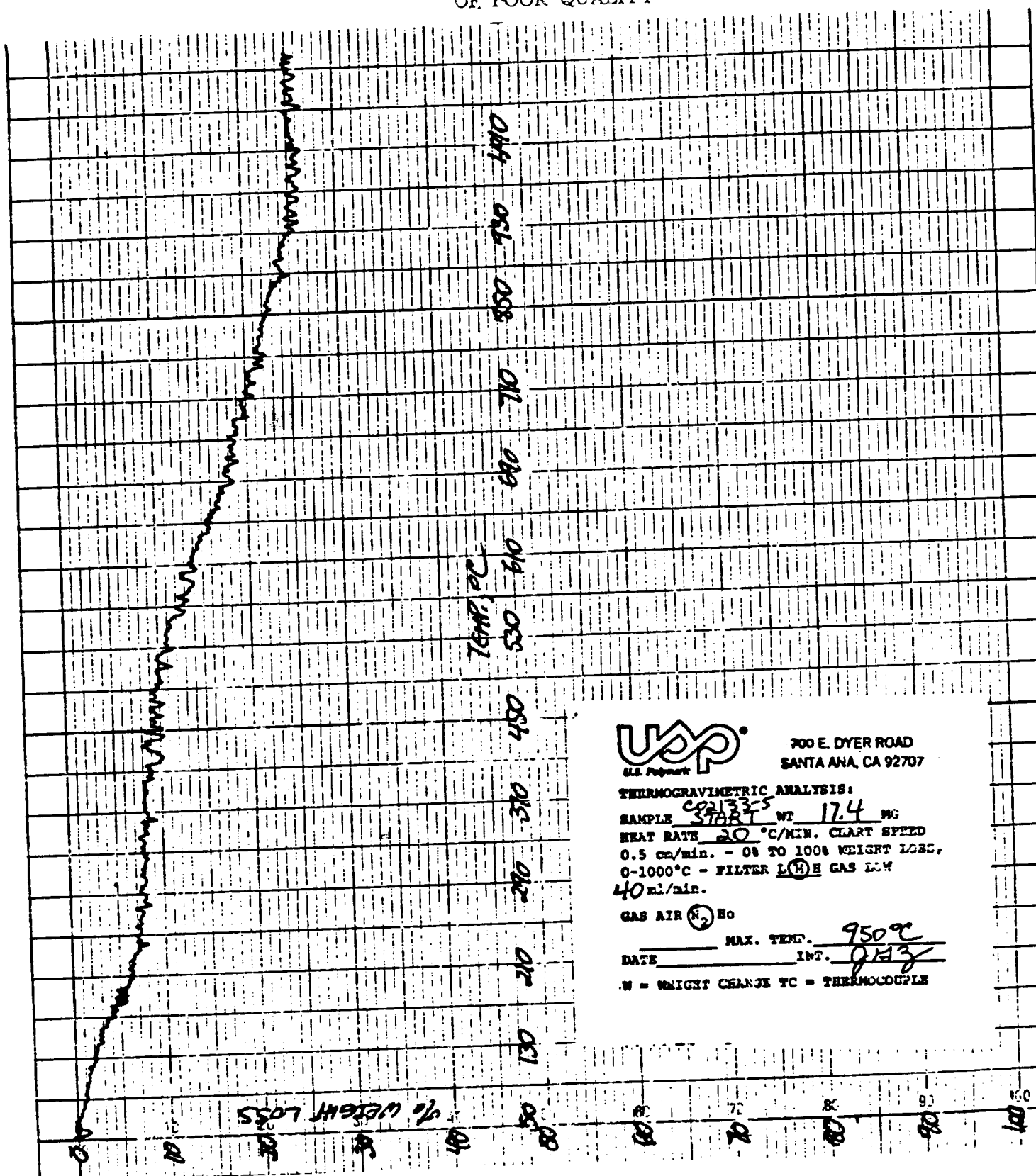
GAS AIR 2 No

MAX. TEMP. 750°C
DATE _____ INT. 8/23

W - WEIGHT CHANGE TC - THERMOCOUPLE

PERKIN-ELMER CHART NO 056-7300

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700 E. DYER ROAD
SANTA ANA, CA 92707

THERMOGRAVIMETRIC ANALYSIS:

SAMPLE CO-133-5 WT 17.4 MG
HEAT RATE 20 °C/MIN. CLART SPEED
0.5 cm/min. - ON TO 100% WEIGHT LOSS,
0-1000°C - FILTER L(H) GAS FLOW
40 ml/min.

GAS AIR (N₂) No

MAX. TEMP. 950°C

DATE

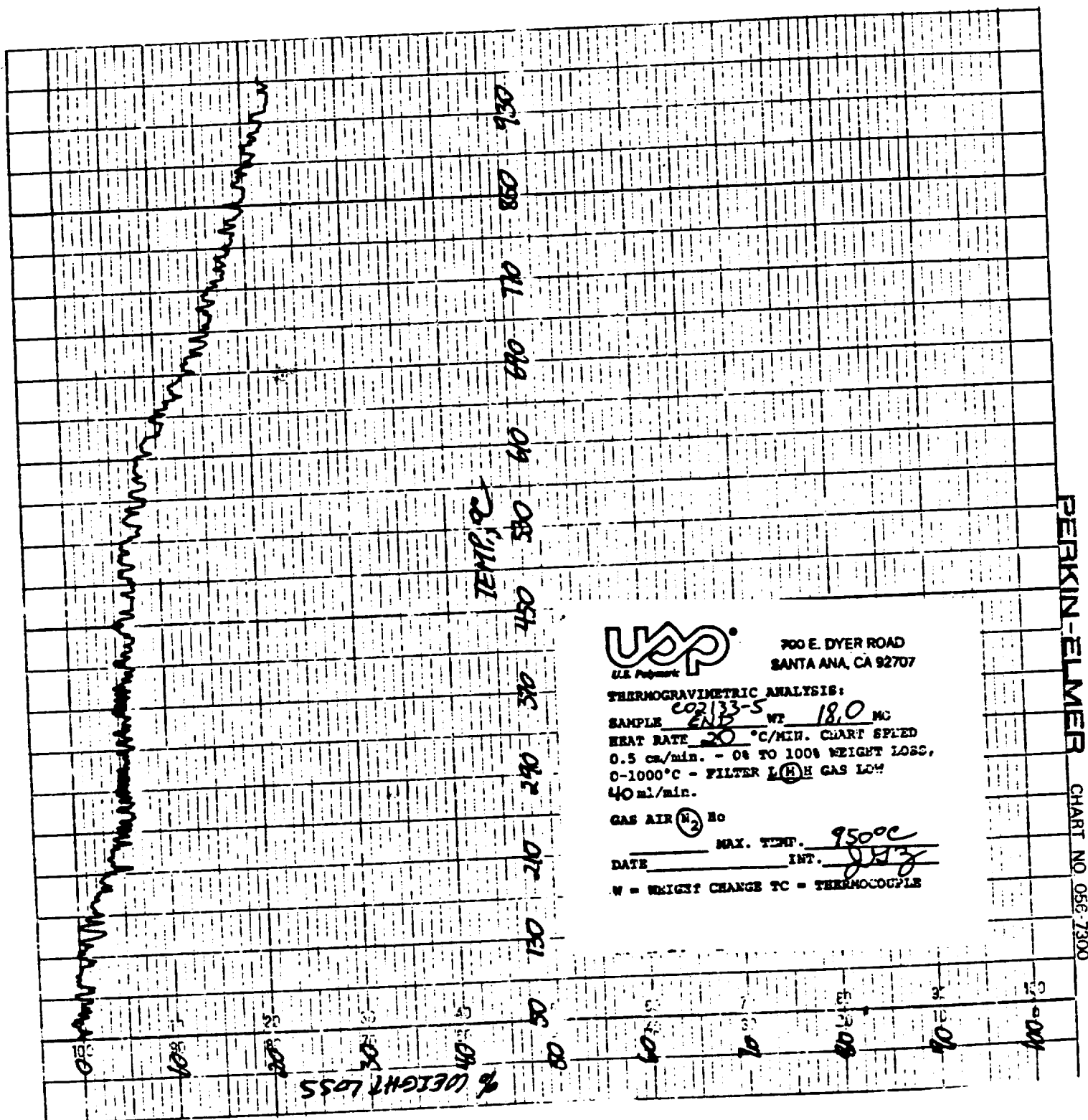
INT. 9/13

W - WEIGHT CHANGE TC - THERMOCOUPLE

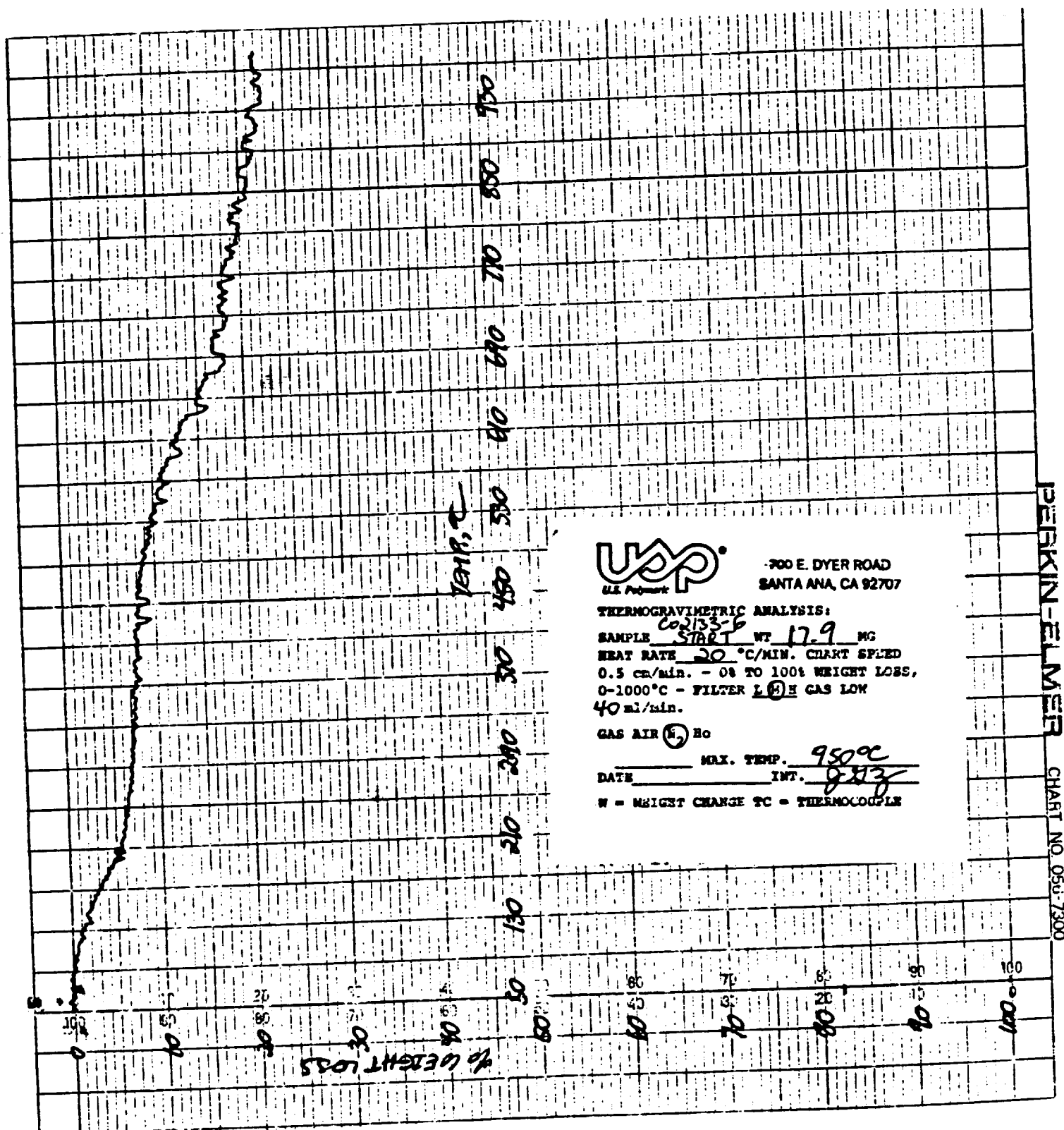
PERKIN-ELMER

CHART NO. 056-7300

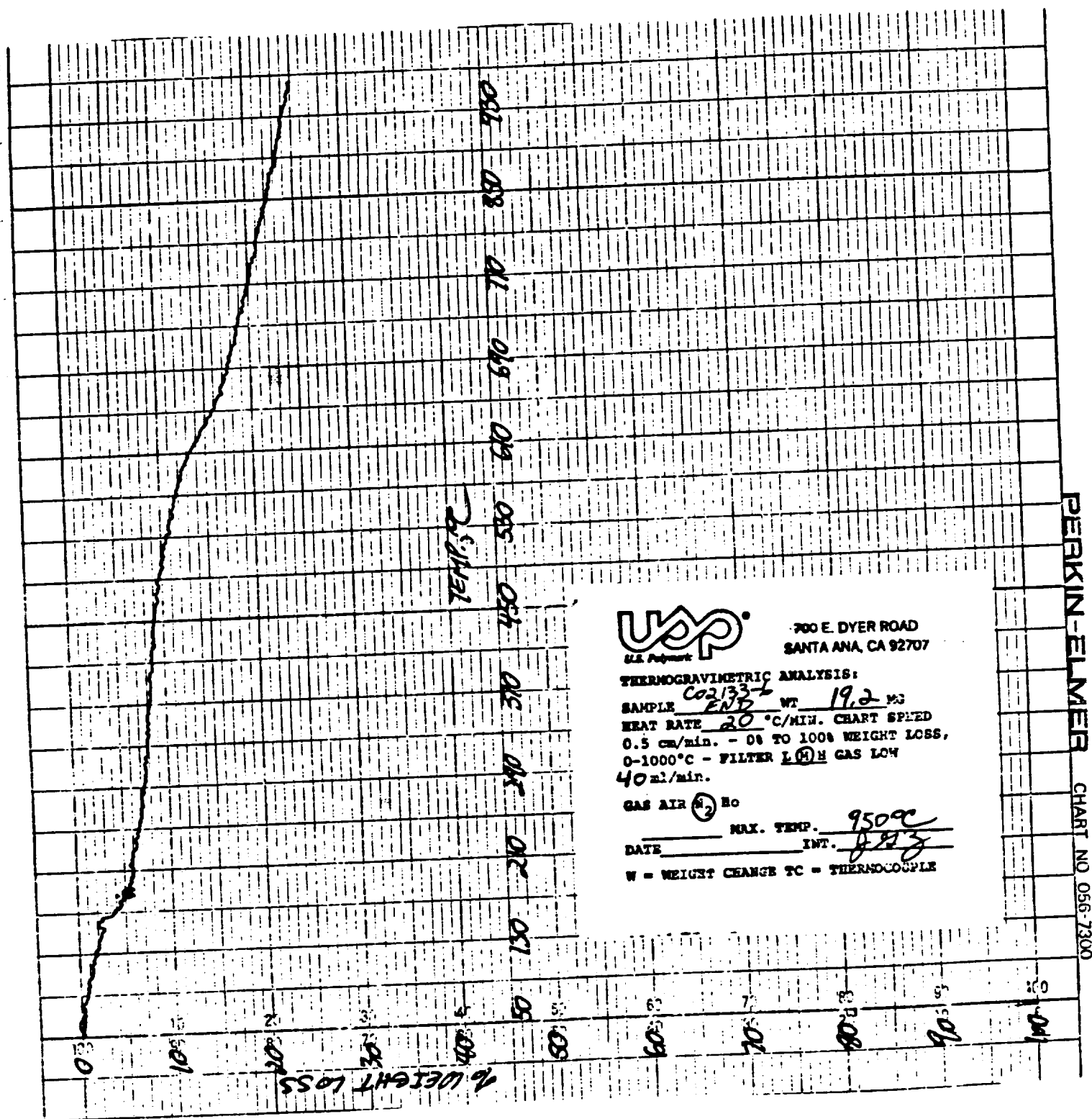
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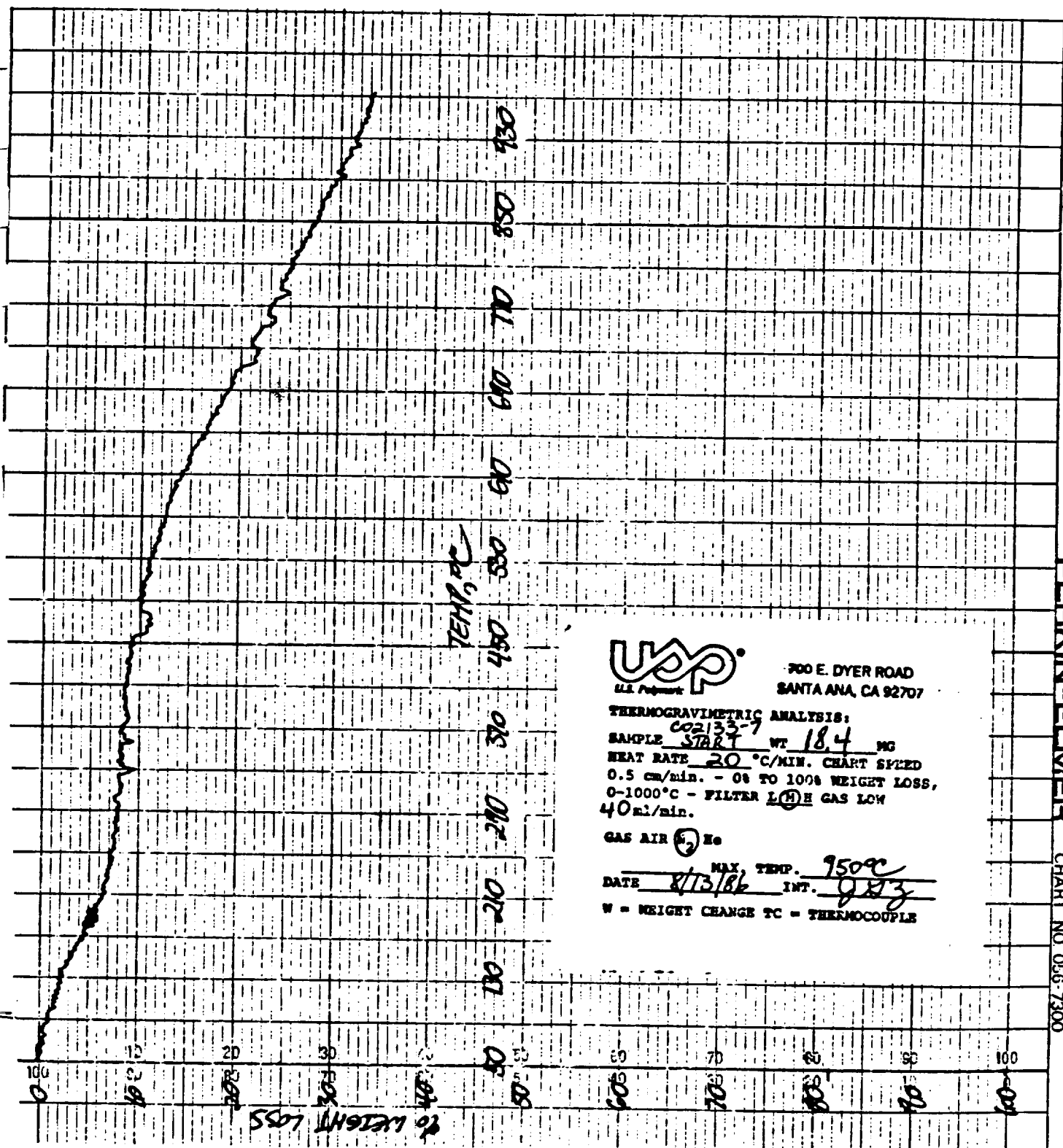
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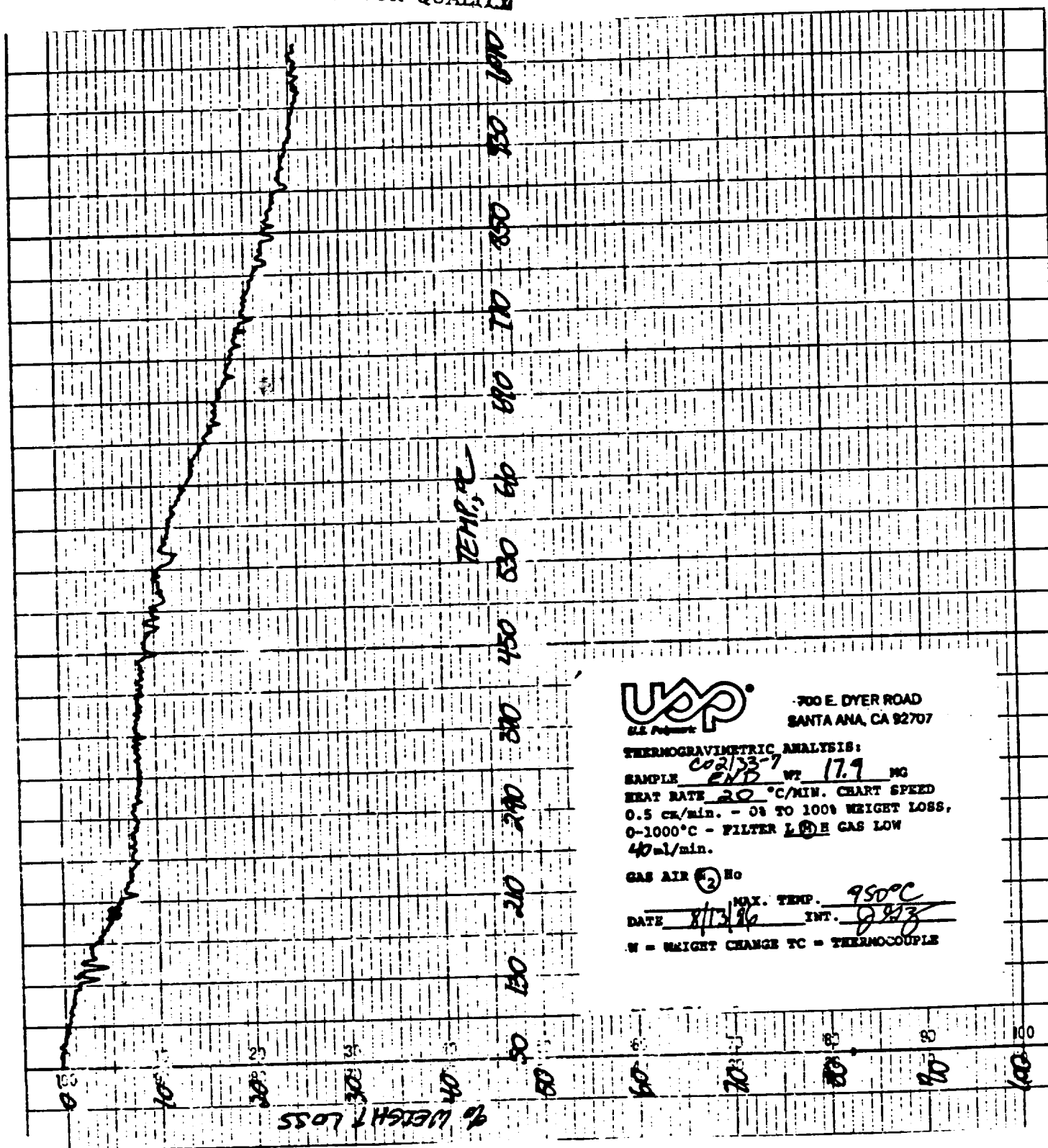
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700 E. DYER ROAD
SANTA ANA, CA 92707

THERMOGRAVIMETRIC ANALYSIS:

SAMPLE Co2133-7 WT. 17.9 MG
HEAT RATE 20 °C/MIN. CHART SPEED
0.5 cm/min. - 0% TO 100% WEIGHT LOSS,
0-1000°C - FILTER L8 GAS LOW
40 ml/min.

GAS AIR 2 No

DATE 8/13/96 MAX. TEMP. 950°C
INT. 9.973

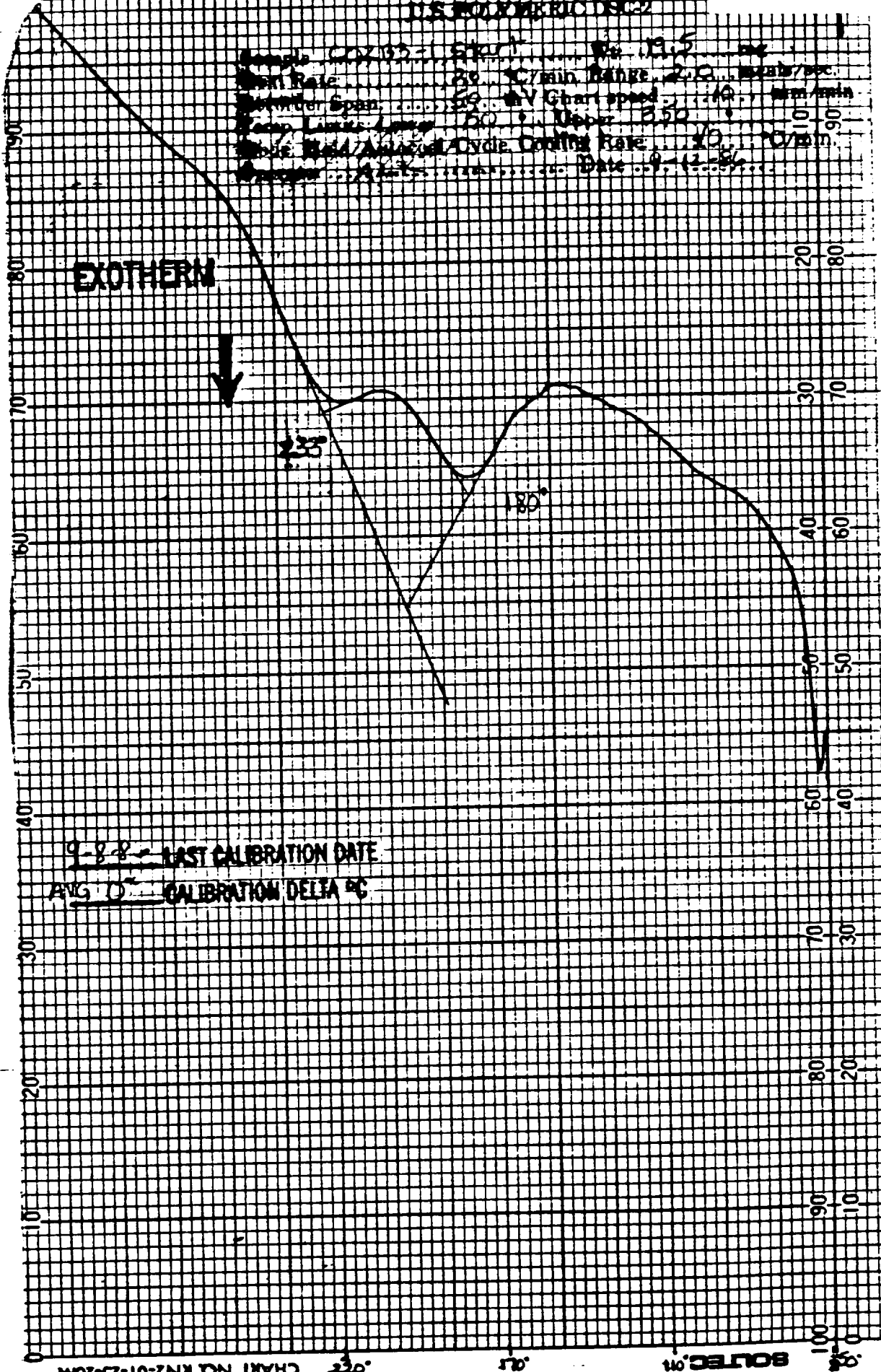
W - WEIGHT CHANGE TC - THERMOCOUPLE

PERKIN-ELMER CHART NO. 056-7300

U.S. POLYMER DSC-2

Sample: COX 33-1 (STY) Wt: 19.5 mg
 Heat Rate: 20 °C/min Range: 2.0 mW/sec
 Potentiometer Span: 50 mV Chart speed: 10 mm/min
 Temp. Limit: Lower 150 Upper 350
 Sample Mass/Analysis Cycle Cooling Rate: 10 °C/min
 Operator: A. J. K. Date: 9-12-86

EXOTHERM



9-8-86 LAST CALIBRATION DATE
 AVG 0 CALIBRATION DELTA °C

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BAX POLYMER INC.

Sample: COV103 = 1.200 Wt. 116.8 mg
 Heat Rate: 20 °C/min Range: 200 mV/div
 Recorder Span: 50 mV Chart Speed: 10 mm/min
 Scale: 1000 mV/div Cycle: 1000 Hz
 Operator: A-K Date: 9-12-86

EXOTHERM

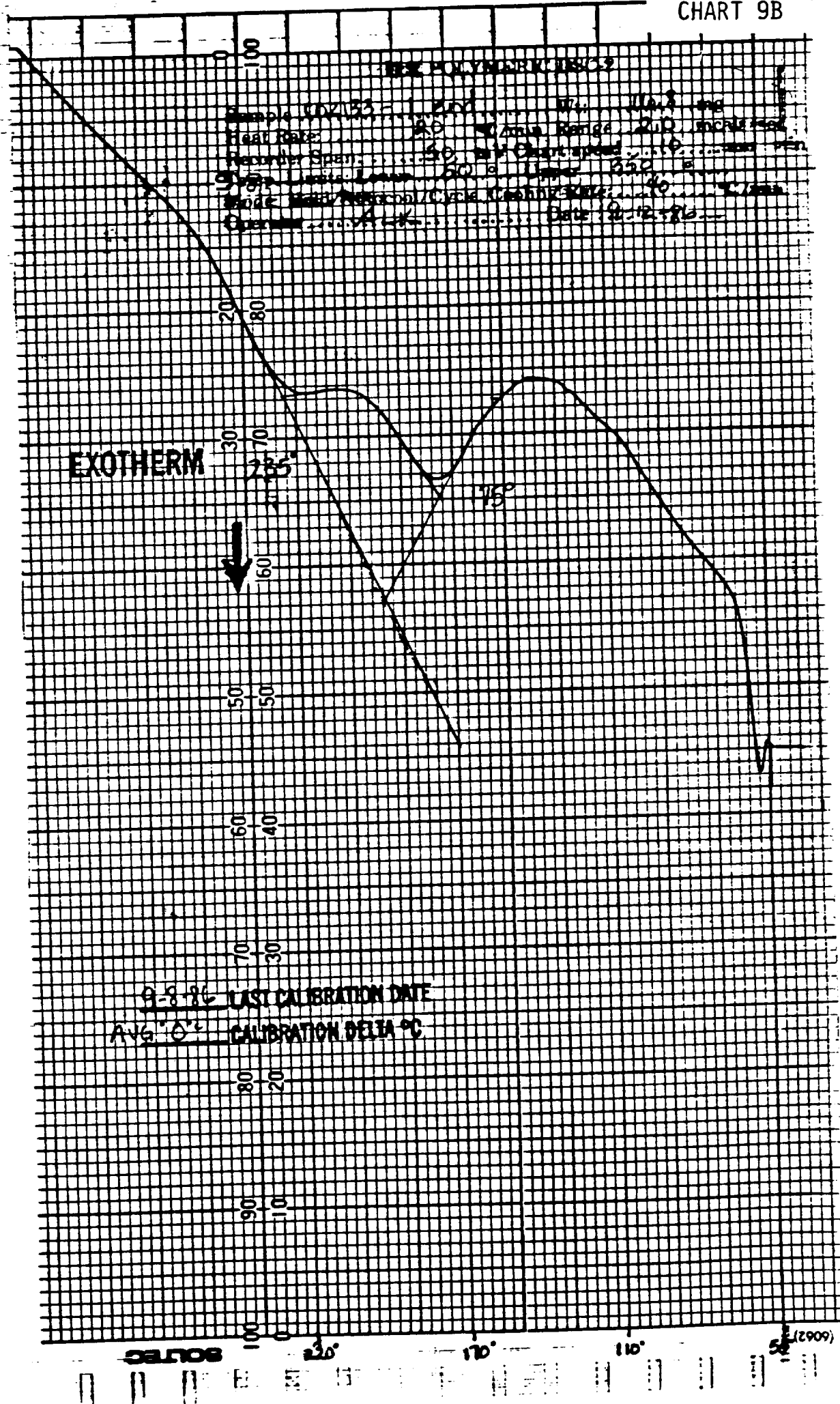
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9-8-86 LAST CALIBRATION DATE

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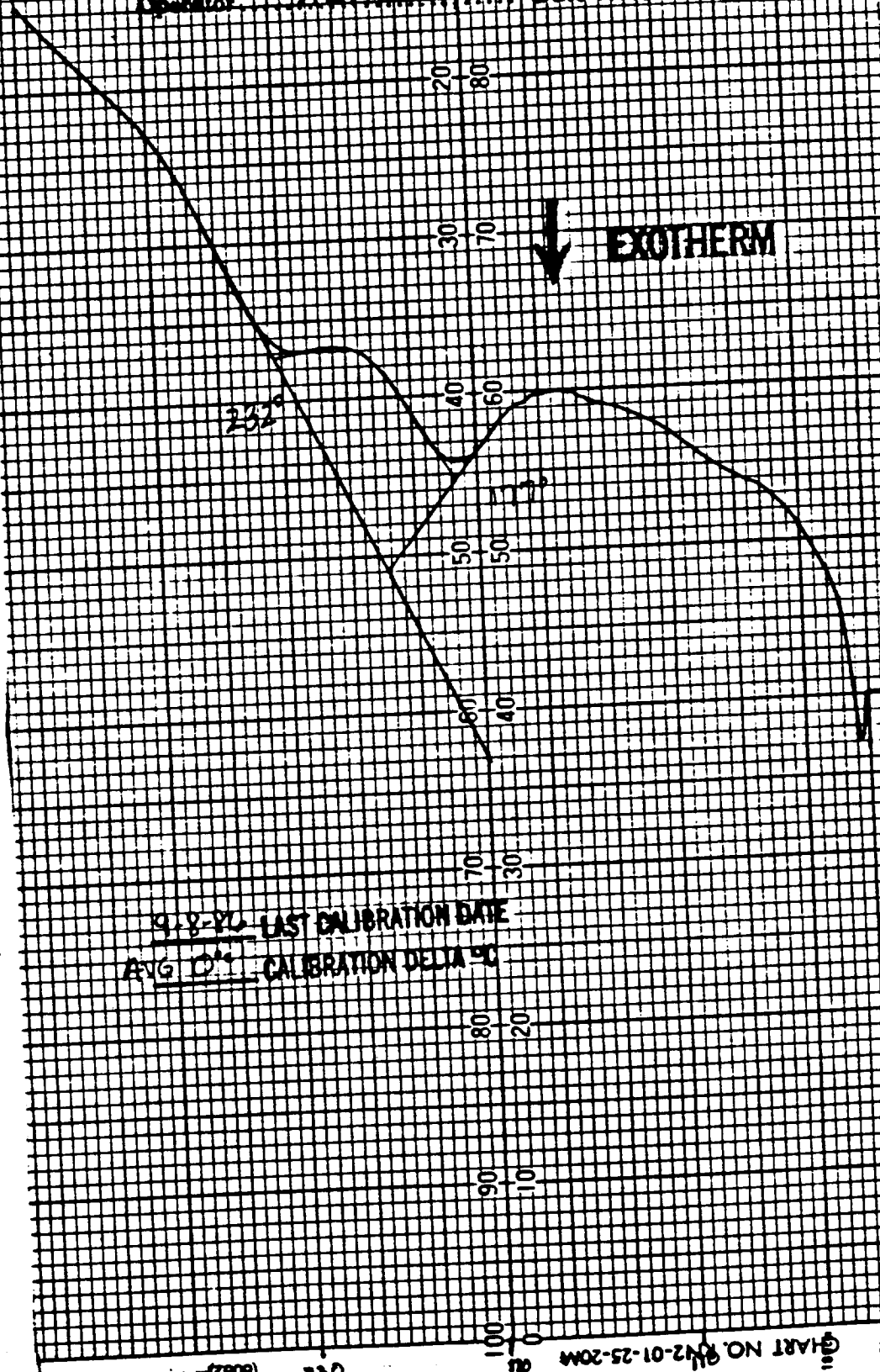
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U.S. POLYMERIC DSC-2

Sample: COZ133-2 Start: Wt. 10.14 mg
 Heat Rate: 20 C/min, Range: 200 mcal/sec
 Sample Span: 50.0 C, Chart speed: 10 mm/min
 Temp. Limits: Lower 50 Upper 350
 Mode: Hold/Auto-cool/Cycle Cooling Rate: 10 C/min
 Operator: E.L.F. Date: 11-14-84

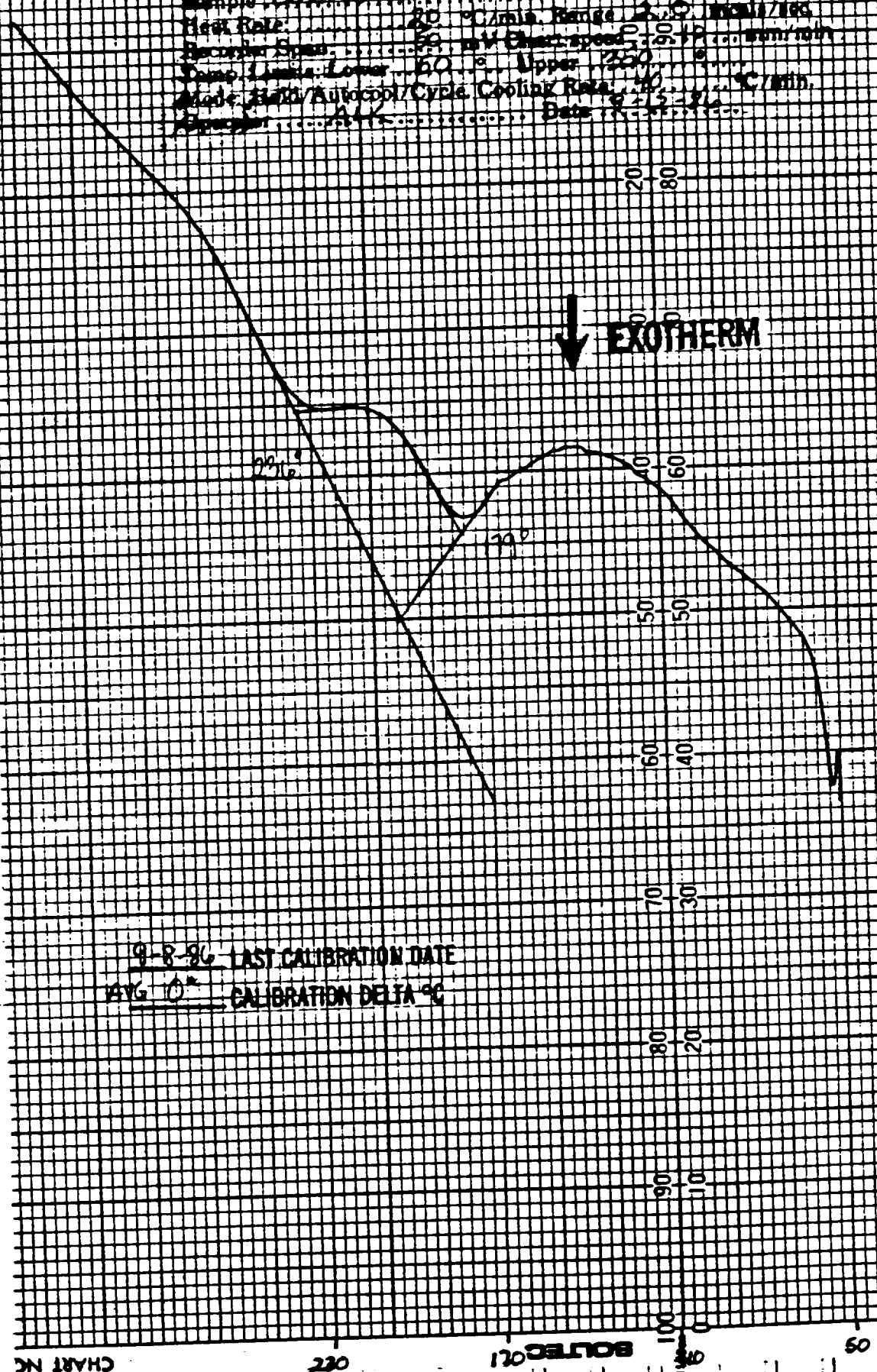
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U.S. POLYMERICS INC.

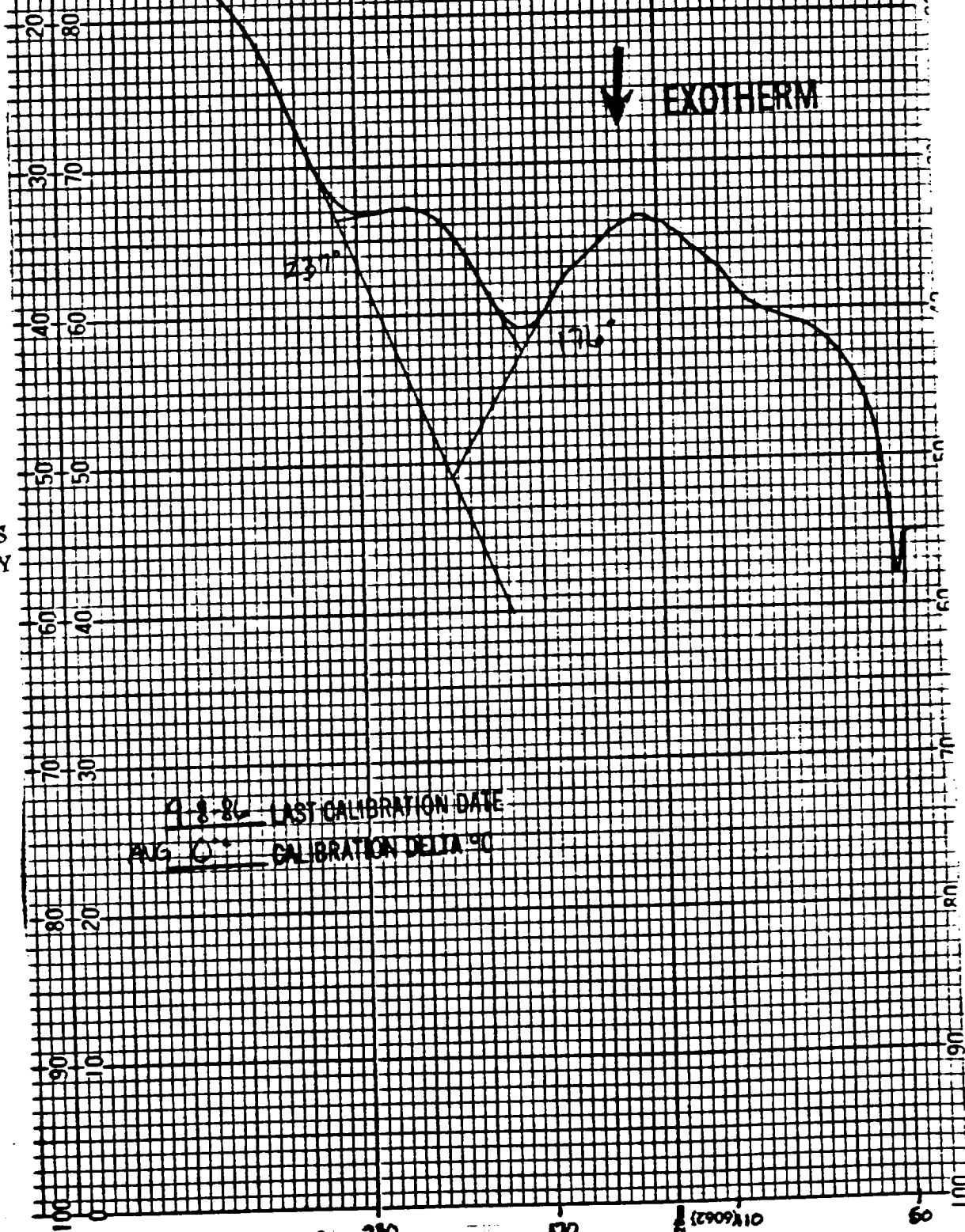
Sample: CO2130-2 END Wt: 17.1 mg
Heat Rate: 20 °C/min. Range: 2.0 mW/100
Recorder Span: 50 mV Chart speed: 5.0 mm/min
Temp. Limits: Lower: 50 ° Upper: 250 °
Mode: Heat/AutoCool/Cycle Cooling Rate: 10 °C/min.
Recorder: A.K. Date: 8-15-86



9-8-86 LAST CALIBRATION DATE
AVG 0° CALIBRATION DELTA °C

U.S. POLYMERIC DSC-2

Sample COZIR-2 3.87g Wt. 1.70g Wt.
 Heat Rate 20 °C/min. Range 2.5 mV/sec
 Recorder Span 50 mV Chart speed 10 mm/min
 Temp. Limits Lower 50 ° Upper 350 °
 Mode Hold/AutoCool/Cycle Cooling Rate 40 °C/min
 Operator ALK Date 9-12-86



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9-8-86 LAST CALIBRATION DATE
 AVG 0 ° CALIBRATION DELTA °C

U.S. POLYMER INC. 2

Sample 10233-3 end Wt. 5.8 mg
 Heat Rate: 20 °C/min Range 2.0 mcal/sec
 Recorder Speed: 50 mm Chart Speed 10 mm/min
 Temp Limits: Lower 50 °C Upper 250 °C
 Mode: Hold/Autocool/Cycle Cooling Rate: 50 °C/min
 Operator AJK Date 1-13-52

↓ EXOTHERM

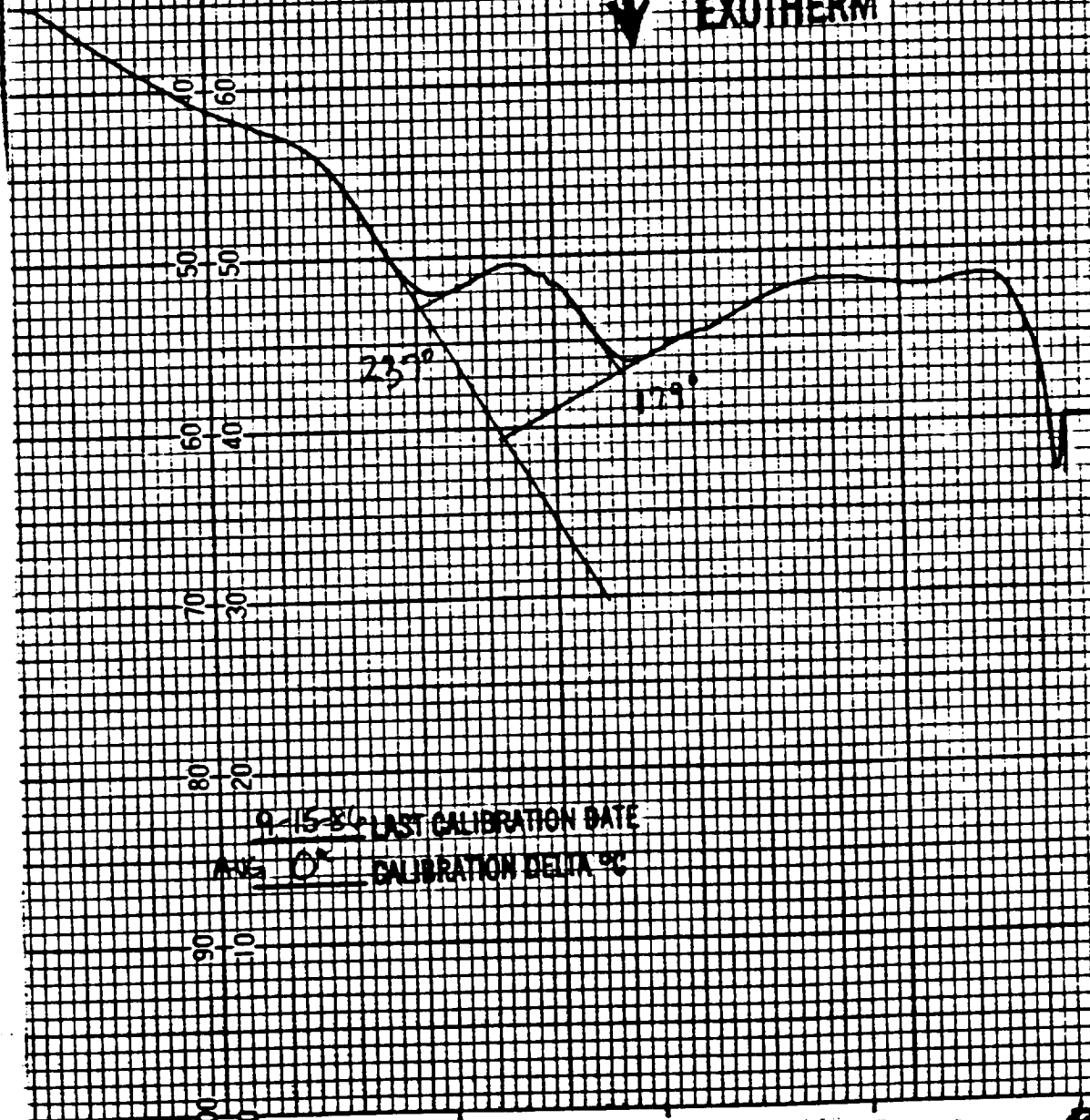
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9-8-96 LAST CALIBRATION DATE
AVG 0.0 CALIBRATION DELTA °C

U.S. POLYMERIC DSC-2

Sample: 602-33-4 500 mg Wt. 100 mg
 Heat Rate: 10 °C/min Range: 2.0 mcal/s
 Recorder Span: 50 mV Chart Speed: 10 mm/min
 Temp. Limits: Lower: 50 °C Upper: 350 °C
 Mode: Hold/Auto Cool/Cycle Cooling Rate: 40 °C/min
 Operator: ALH Date: 9-15-84

↓ EXOTHERM



9-15-84 LAST CALIBRATION DATE

AVG 0° CALIBRATION DELTA $^{\circ}\text{C}$

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U.S. POLYMERIC DSC2

Sample: CDZ-53-1 CVD Wt: 5.16 g
 Heat Rate: 20 °C/min Range: 20 to 350 °C
 Recorder Span: 50 mV Chart Speed: 10 mm/min
 Temp. Limits: Lower 50 °C Upper 350 °C
 Heat Hold/Autocool/Cycle: Cooling Rate: 40 °C/min
 Operator: ALK Date: 9-14-84

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EXOTHERM

23.7°

17.8°

9-15-84 LAST CALIBRATION DATE

ANG 0° CALIBRATION DELTA °C

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130 CALS

110

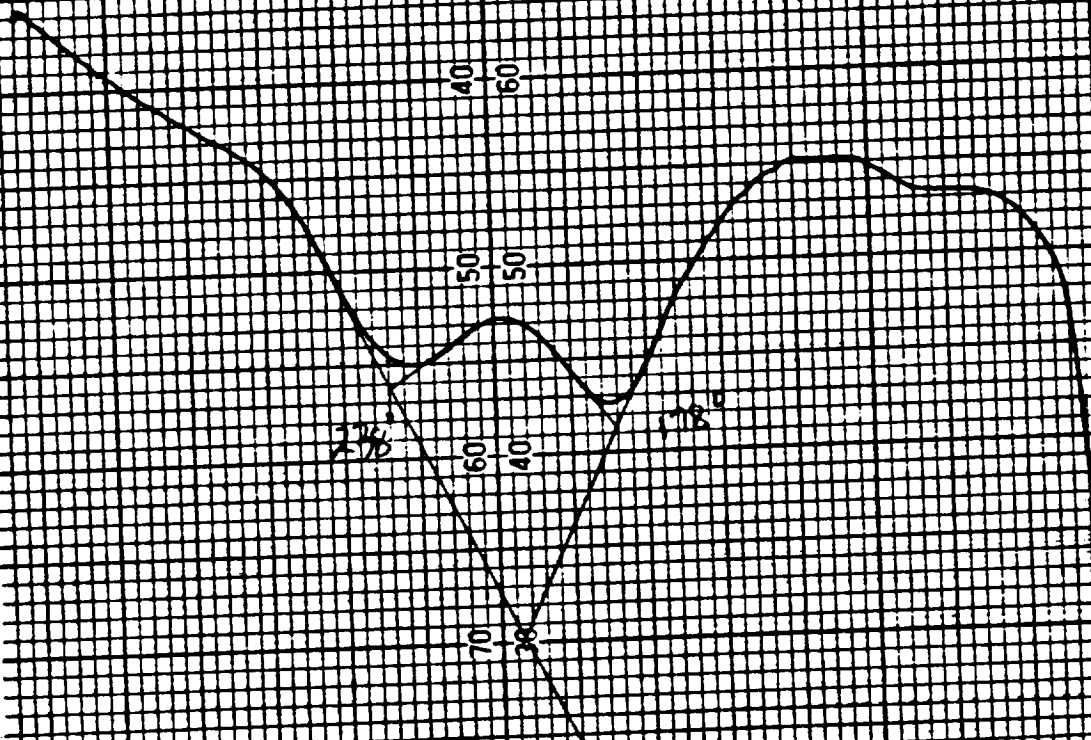
50

DSC POLYMER DSC

Sample: 02-20-5 (507) Wt: 19.8 mg
 Heat Rate: 20 °C/min Range: 20.0 sec
 Recorder Span: 50 mV Chart Speed: 100 mm/min
 Temp. Limits: Lower: 50 °C Upper: 350 °C
 Mode: Hold/Autohold/Cycle Cooling Rate: 50 °C/min
 Operator: R.L. Date: 4-11-86

↓ EXOTHERM

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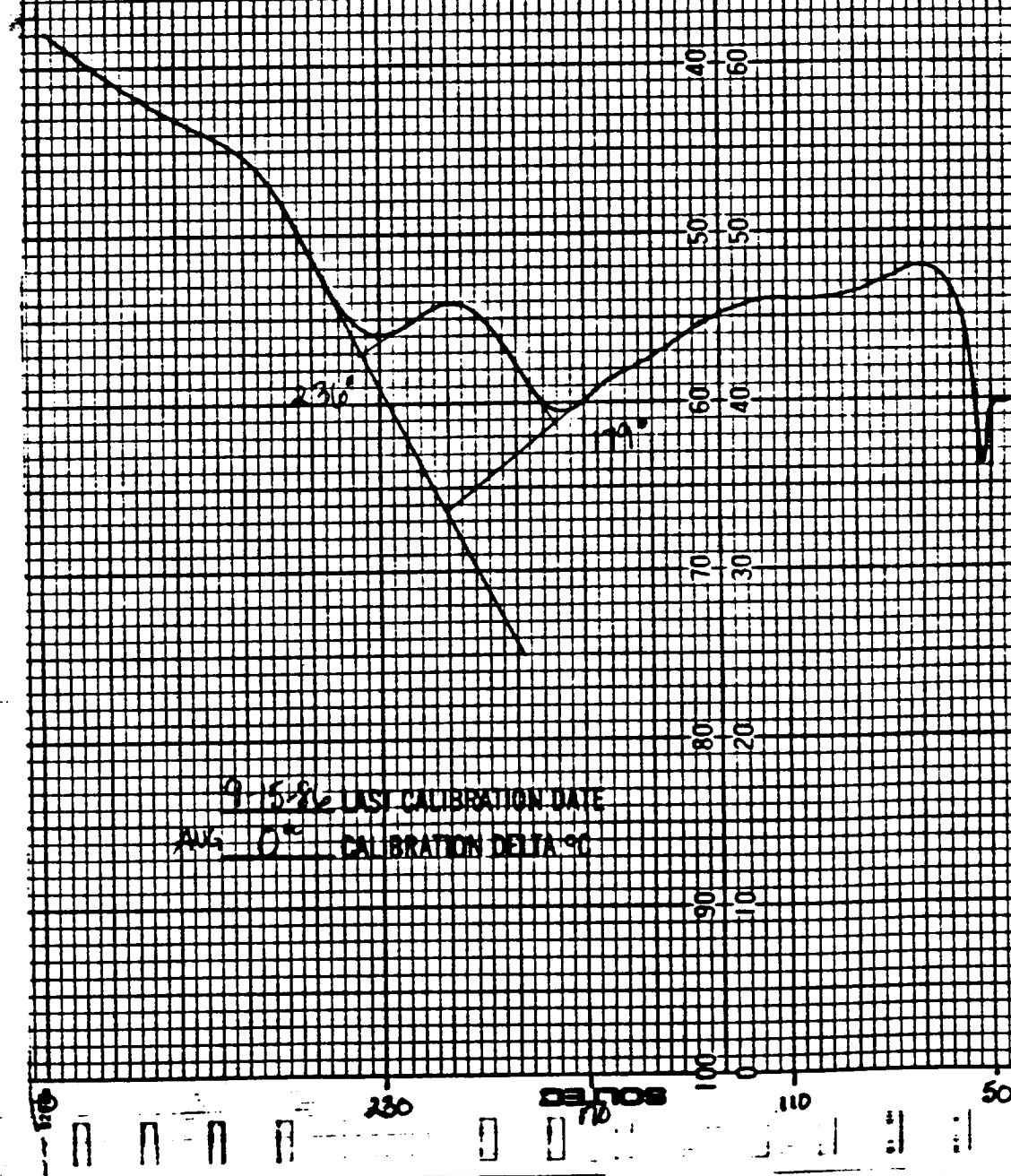
9-5-86 LAST CALIBRATION DATE
 AVG 0.0° CALIBRATION DELTA °C

US POLYMER DSC-2

Sample CO-2-33-5 End 17.1 mg
 Heat Rate: 20 °C/min. Range 0-250 mWatts/sec.
 Recorder Span: 25 mV Chart speed 10 mm/min.
 Temp. Limits: Lower 50 Upper 350
 Mode: Hold/AutoCool/Cycle Cooling Rate: 10 °C/min.
 Operator ALK Date 9-16-86

↓ EXOTHERM

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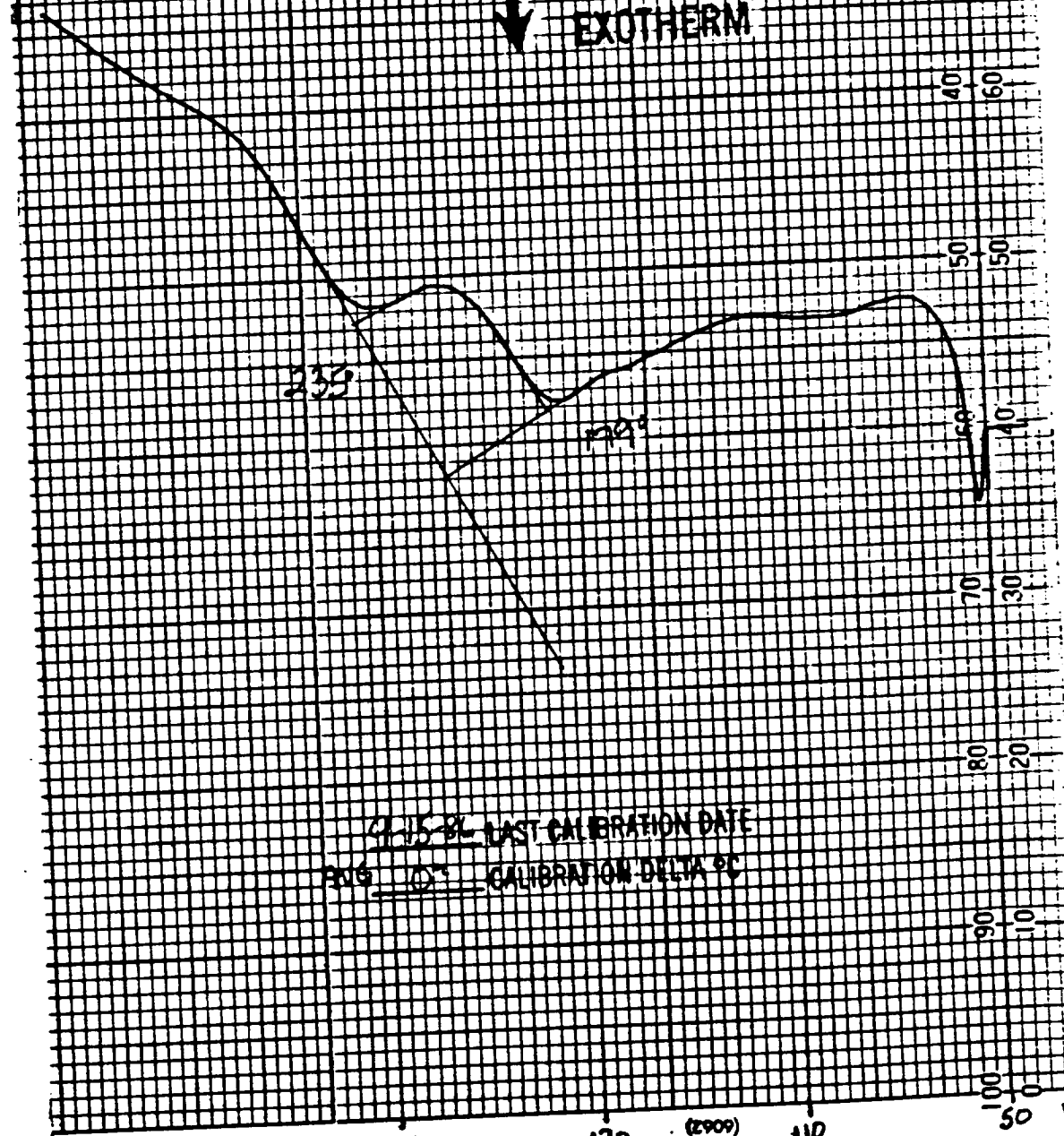


U.S. POLYMER INC.

Sample: 002-35-10510 Wt: 1.3 mg
 Heat Rate: 25 °C/min. Range: 2.0 mV/sec.
 Recorder Span: 50 mV Chart speed: 10 mm/min
 Temp. Limits: Lower 30 Upper 350 °C
 Mode: Hold/Autocool/Cycle Cooling Rate: 40 °C/min
 Operator: AK Date 9-11-86

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↓ EXOTHERM

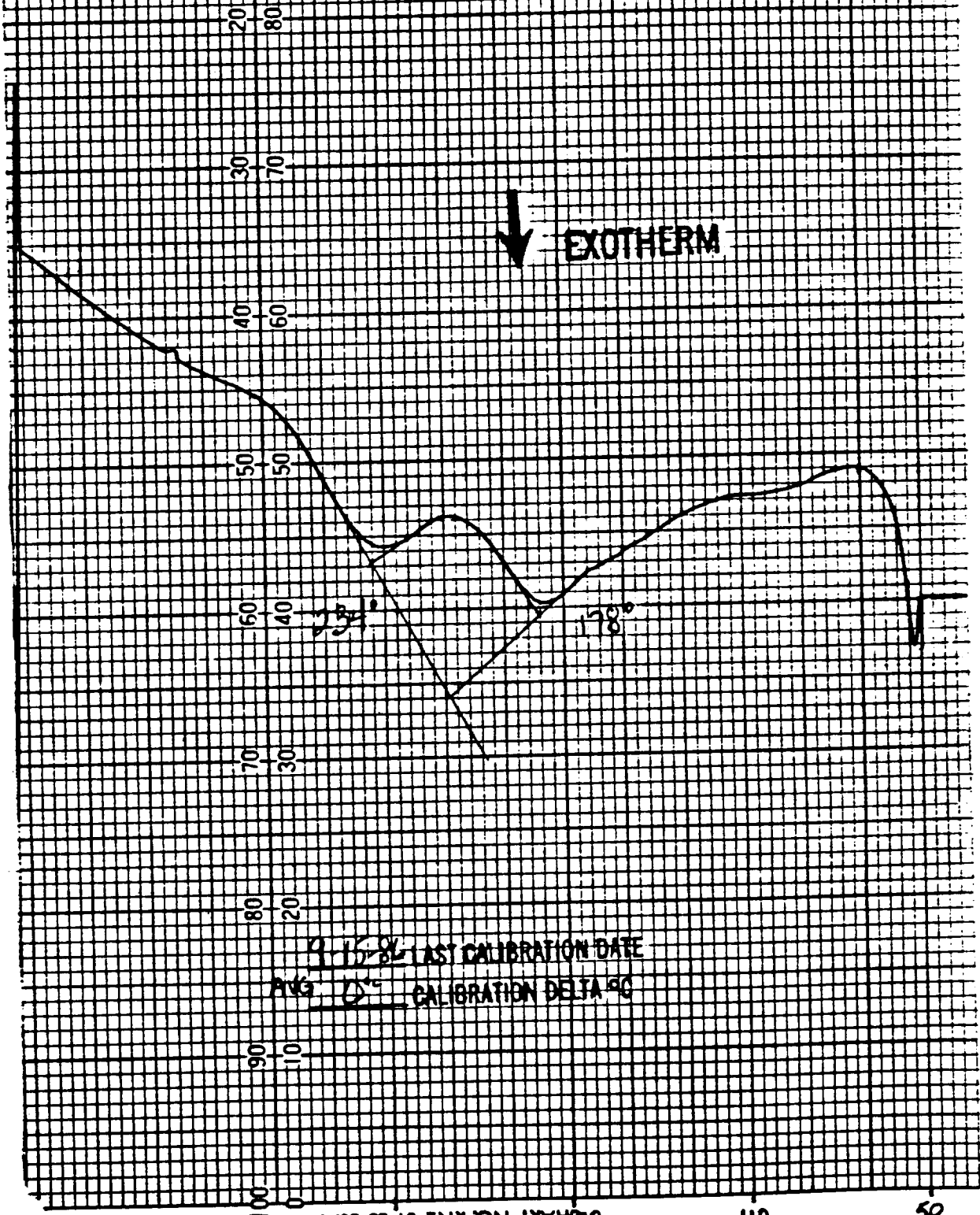


9-15-86 LAST CALIBRATION DATE
 0.0° CALIBRATION DELTA °C

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U.S. POLYMERIC DSC-2

Sample 062133-16 end w. 17.4 mg
Heat Rate: 20 °C/min Range 210 mcal/sec
Recorder Span: 50 mV Chart speed 10 mm/min
Temp. Limits: Lower 50 ° Upper 350 °
Mode: Hold/Auto Cool/Cycle Cooling Rate 10 °C/min
Operator ALR Date 9-16-81



9-16-81 LAST CALIBRATION DATE
AVG 0.0 CALIBRATION DELTA °C

POLYMERIC DSC

Sample: C02133-7 Start: We 118.0
 Heat Rate: 25 °C/min Range: 2.48 mW/sec
 Recorder Span: 60 mV Chart speed: 18 mm/min
 Temp. Limits: Lower 50 °C Upper 250 °C
 Hold: Auto Cool Cycle Cooling Rate: 40 °C/min
 Operator: ALK Date: 9-14-86

↓ EXOTHERM

235°

178°

9-5-86 LAST CALIBRATION DATE

AVG 0 CALIBRATION DELTA °C

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2300JULI08

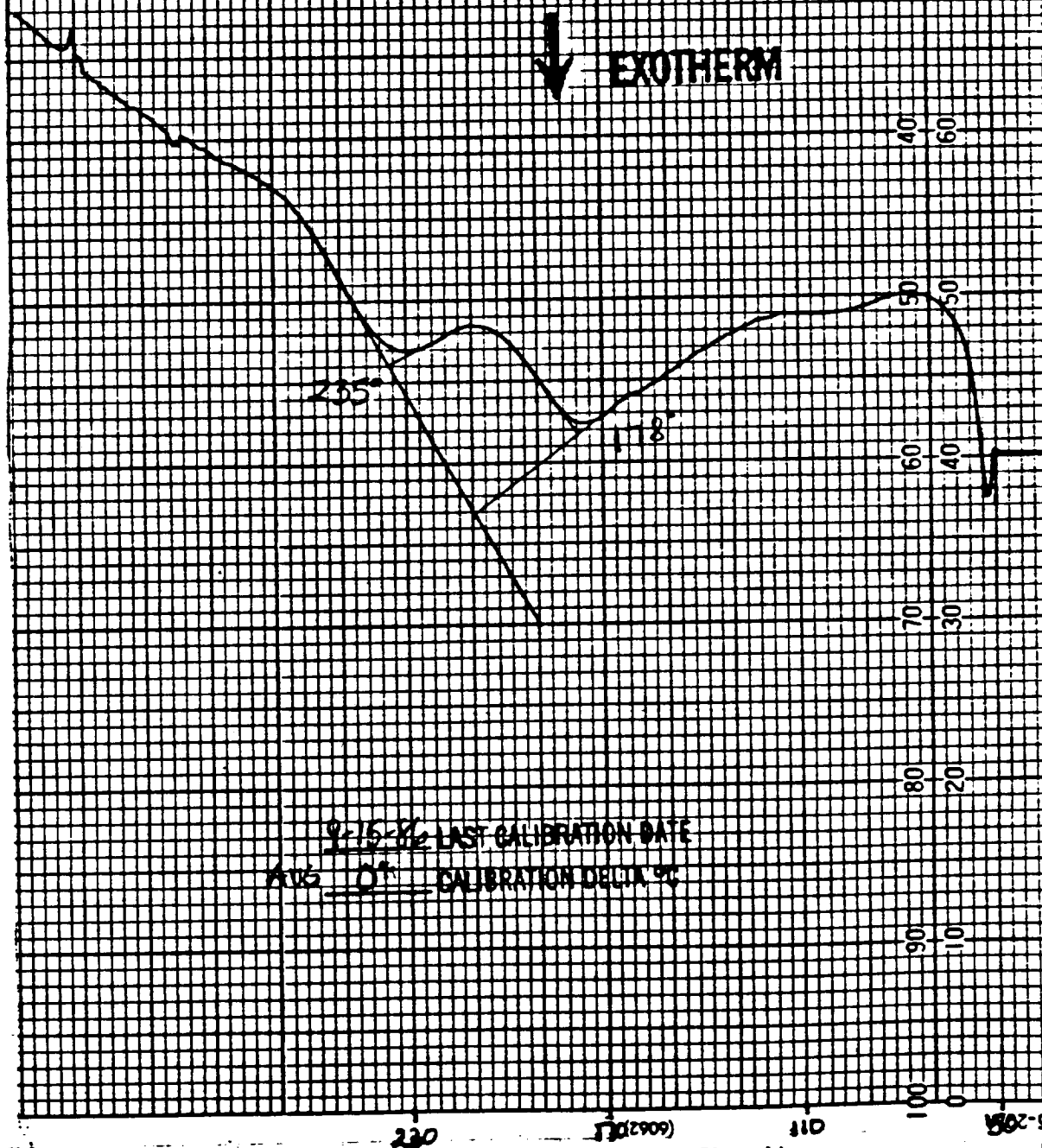
170

110

50

MIS POLYMERIC DSC2

Sample COZIB-7.1 (PVA) Wt 17.12 mg
 Heat Rate 20 °C/min Panike 2.9 microsec
 Recorder Span 50 mV Chart speed 10 mm/min
 Temp. Limit Lower 50 ° Upper 250 °
 Mode Hold/Autocool/Cycle Cooling Rate 10 °/min
 Operator ALK Date 9-16-86

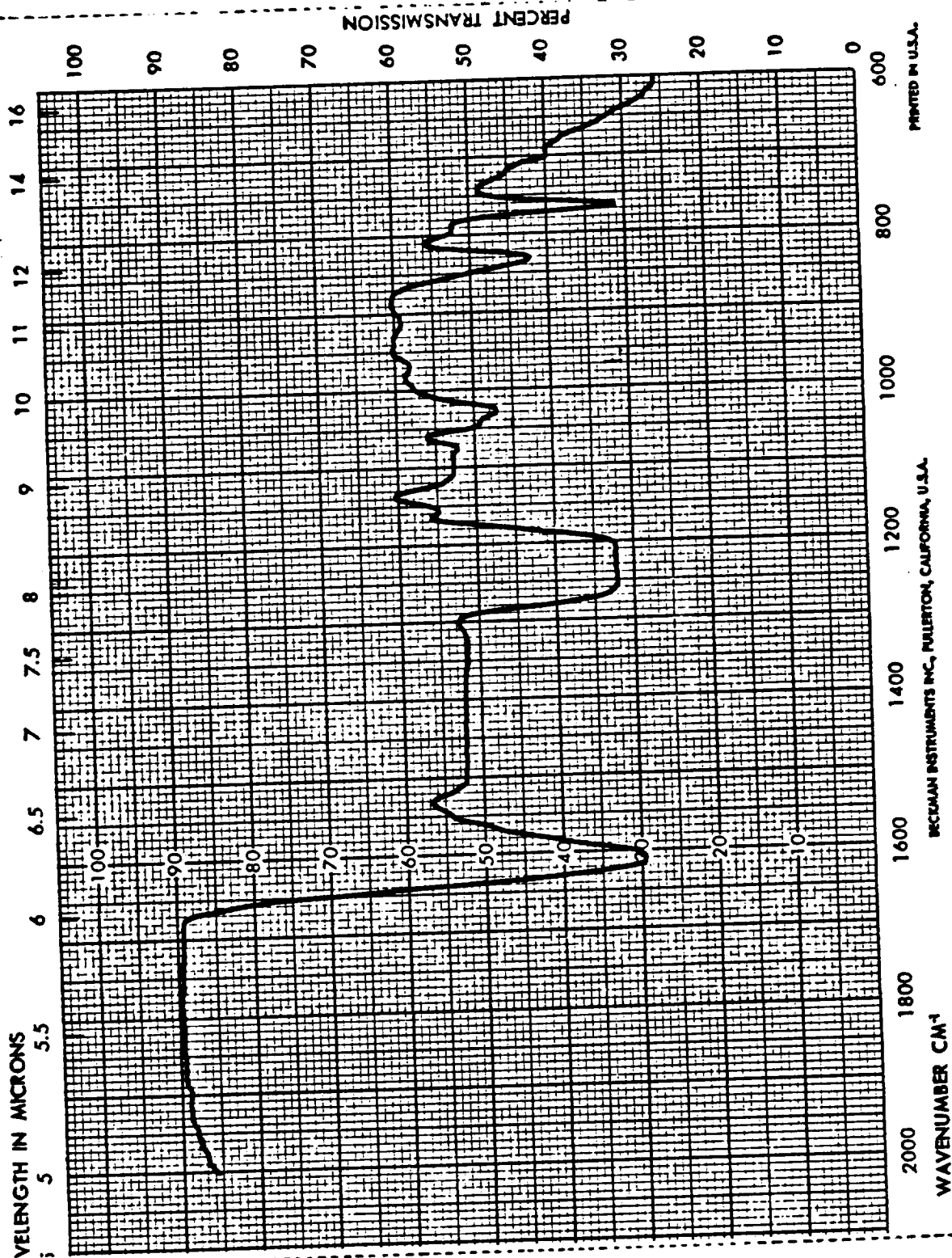


9-15-86 LAST CALIBRATION DATE

AVG 0° CALIBRATION DELTA °C

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SPECTRUM NO. 15211

DATE 7-08-84

SAMPLE FM 50550

CO 2133 # 5T-1

SOURCE _____

STRUCTURE _____

PATH 0.2 mm NACL

SOLVENT ACETONE

CONCENTRATION 30-50%

PHASE 1

COMMENTS PRE-PREG

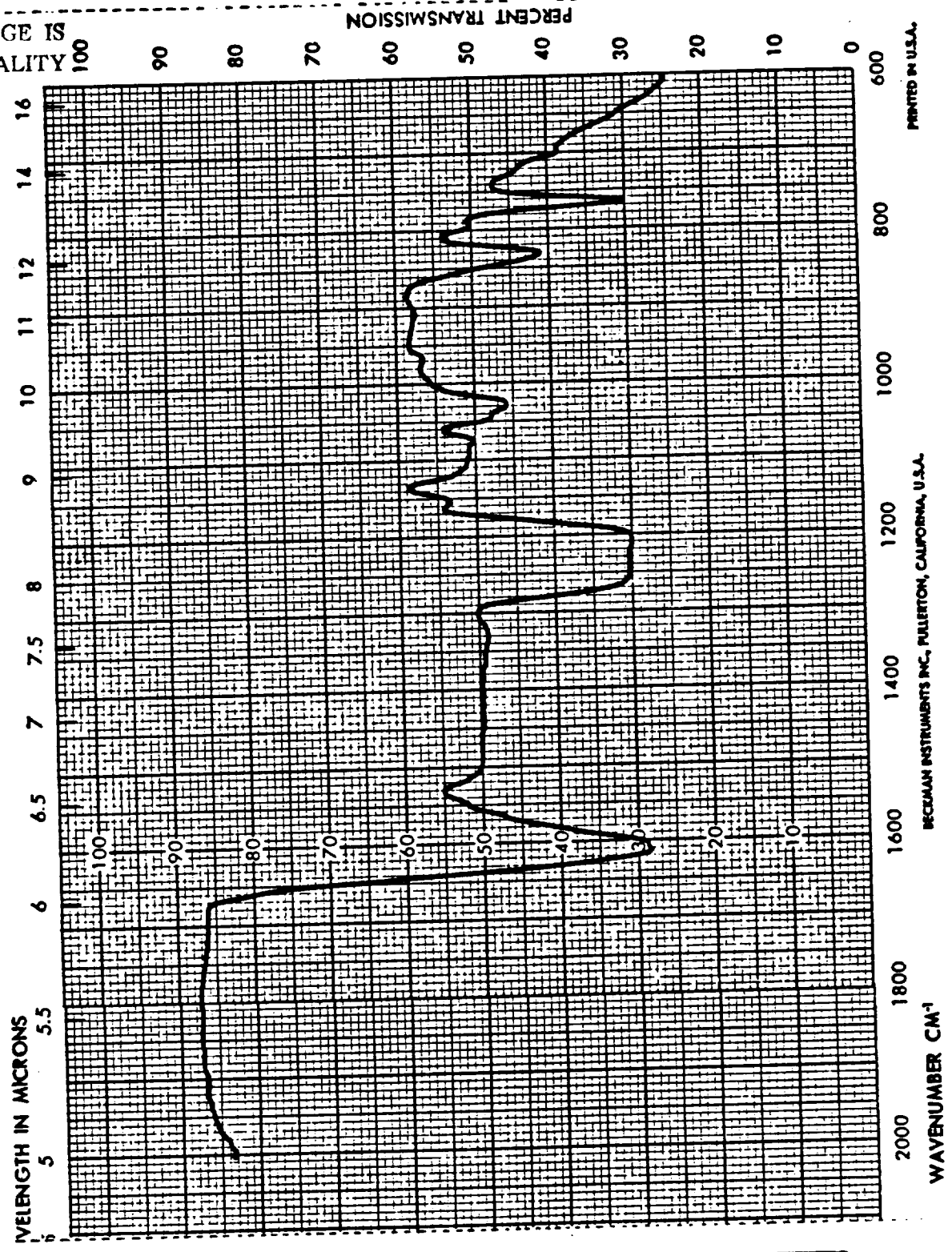
MATERIAL

ANALYST Y. MIRANDA

Beckman®

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SPECTROPHOTOMETER

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SPECTRUM NO. 15212
 DATE 7-08-84
 SAMPLE FM 5055 B
CD 2133 # E-1

SOURCE _____
 STRUCTURE _____

PATH 0.2 mm LiAcL
 SOLVENT ACETONE
 CONCENTRATION 30-50%
 PHASE 3
 COMMENTS PRE-PREG
MATERIAL

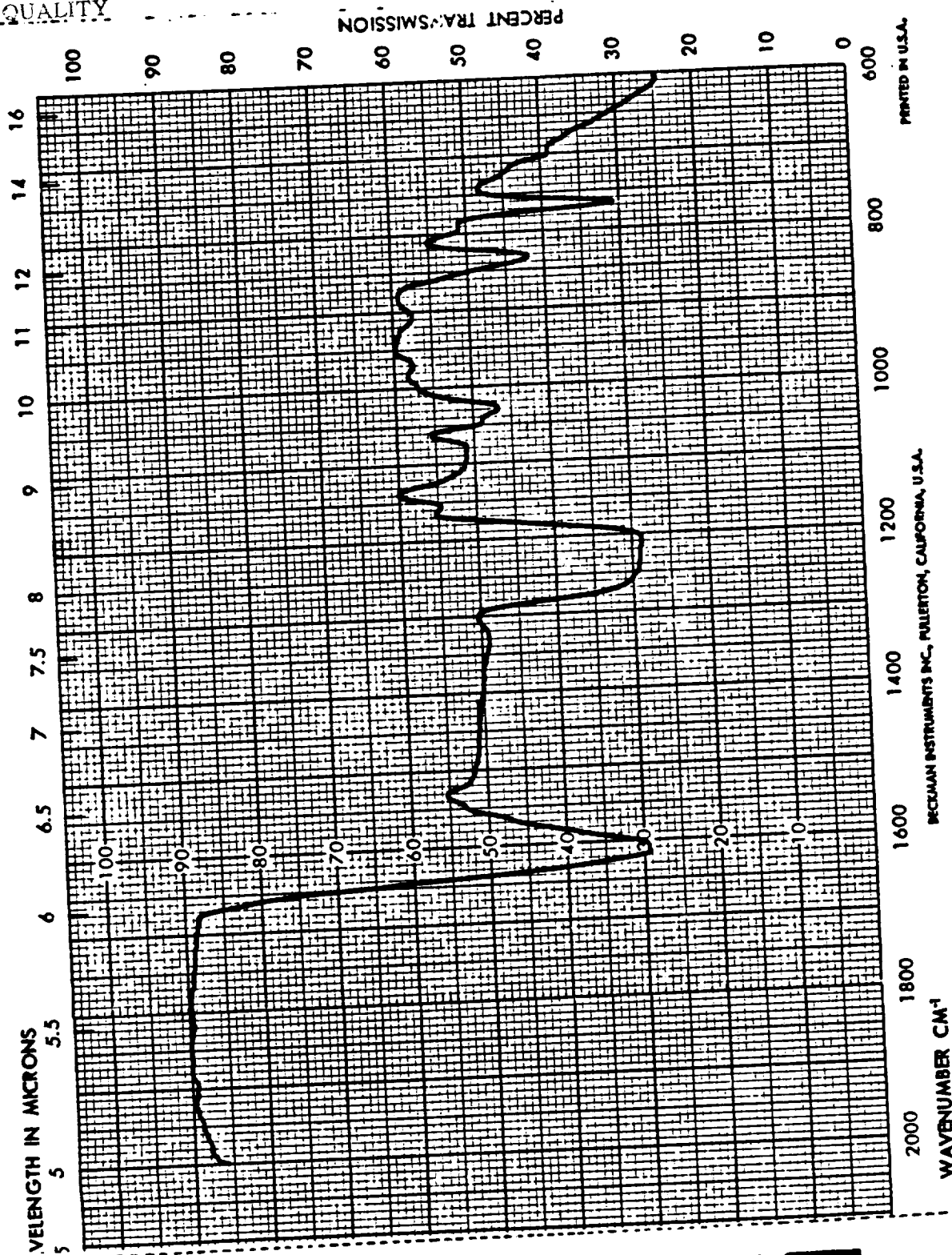
ANALYST V. MIRANDA



INFRARED
SPECTROPHOTOMETER

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SPECTRUM NO. 15213
DATE 7-08-86
SAMPLE FM 5056 B
CO2133 # 5T-2

SOURCE

STRUCTURE

PATH 0.2 mm NaCl
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

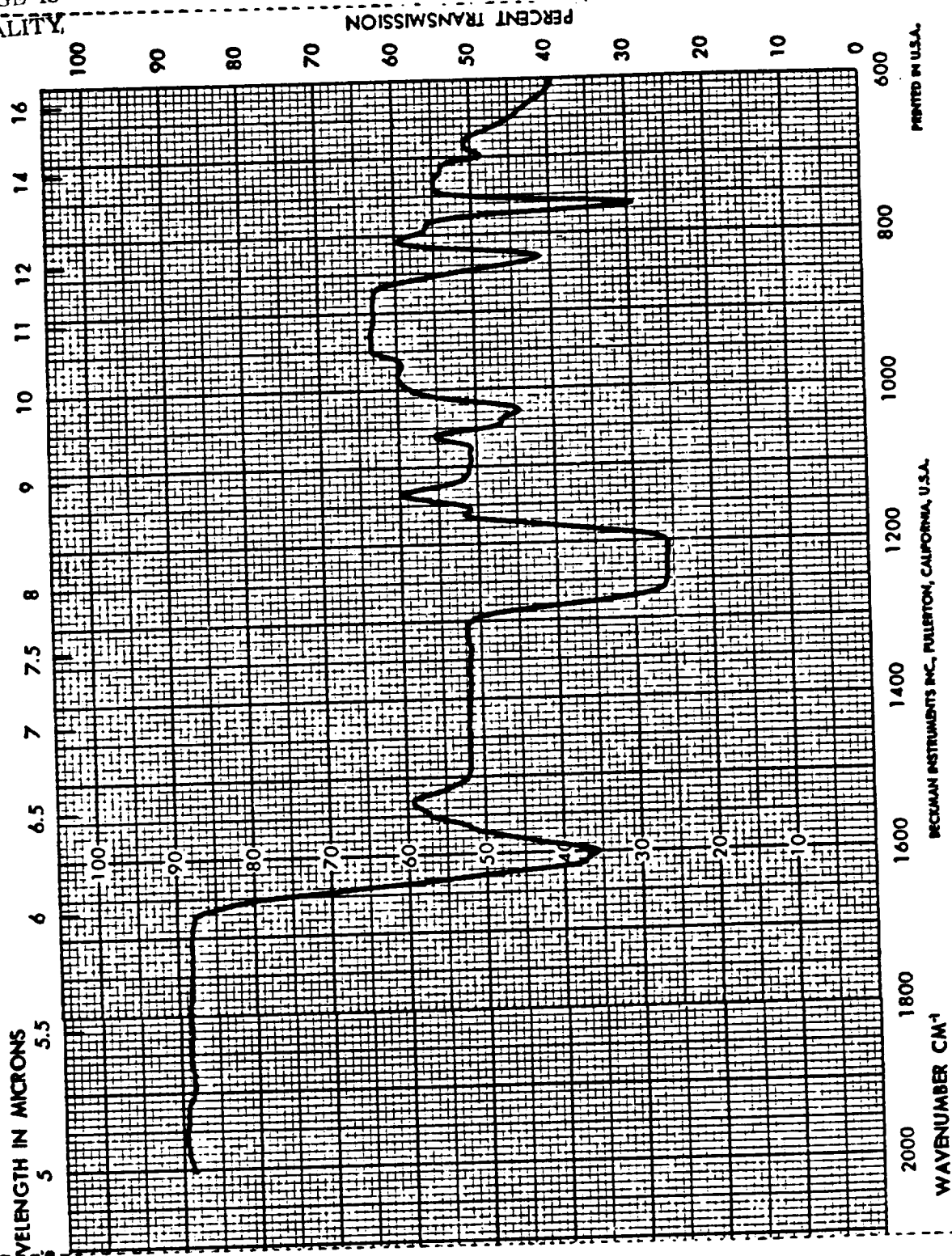
ANALYST Y. MIRANDA

Beckman®

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SPECTROPHOTOMETER

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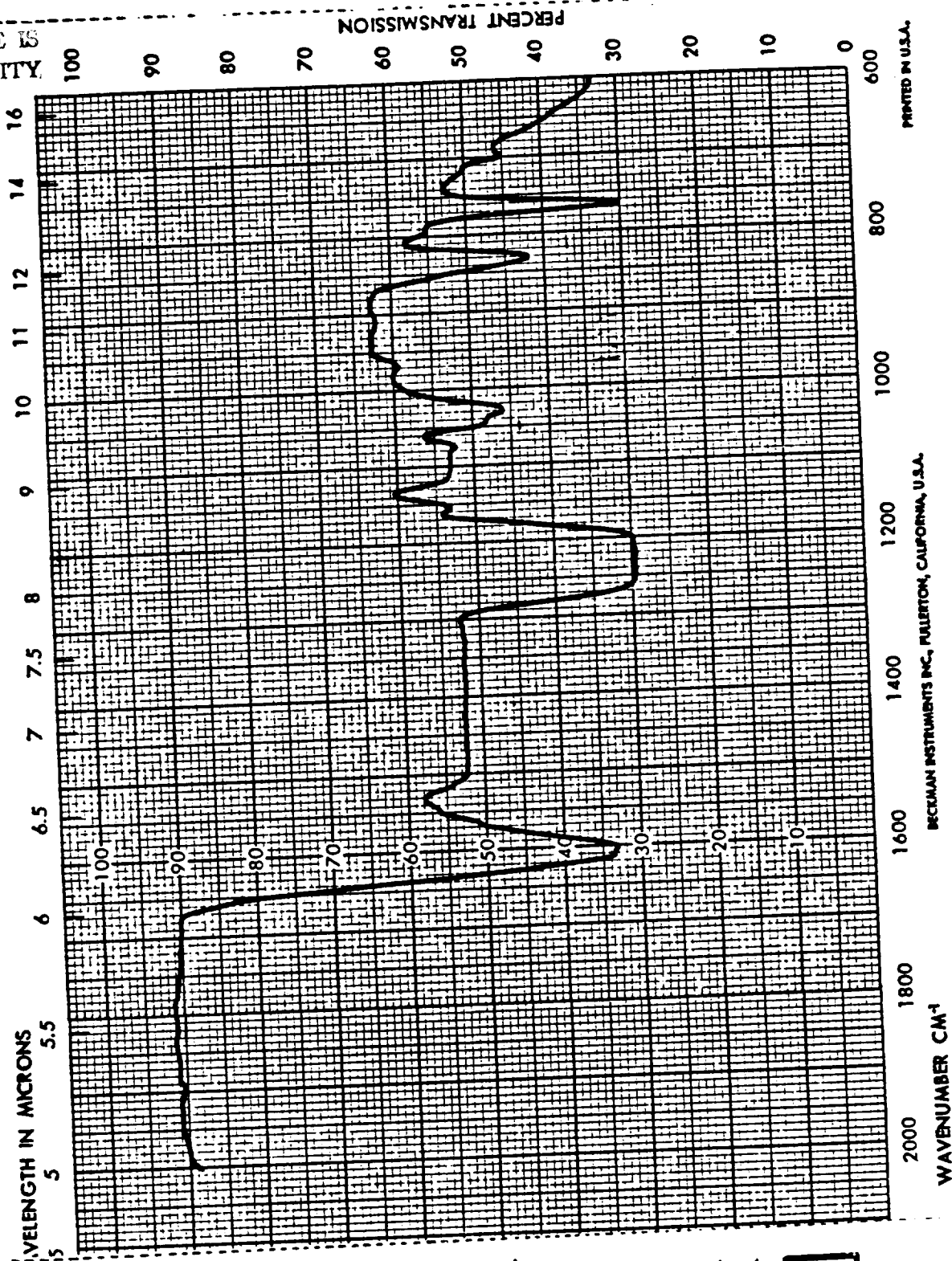
CHART 10D



SPECTRUM NO. 15214
DATE 7-08-66
SAMPLE FM 50550
CO2133 # E-2
SOURCE _____
STRUCTURE _____
PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 50-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL
ANALYST V. MURRAY

Beckman®

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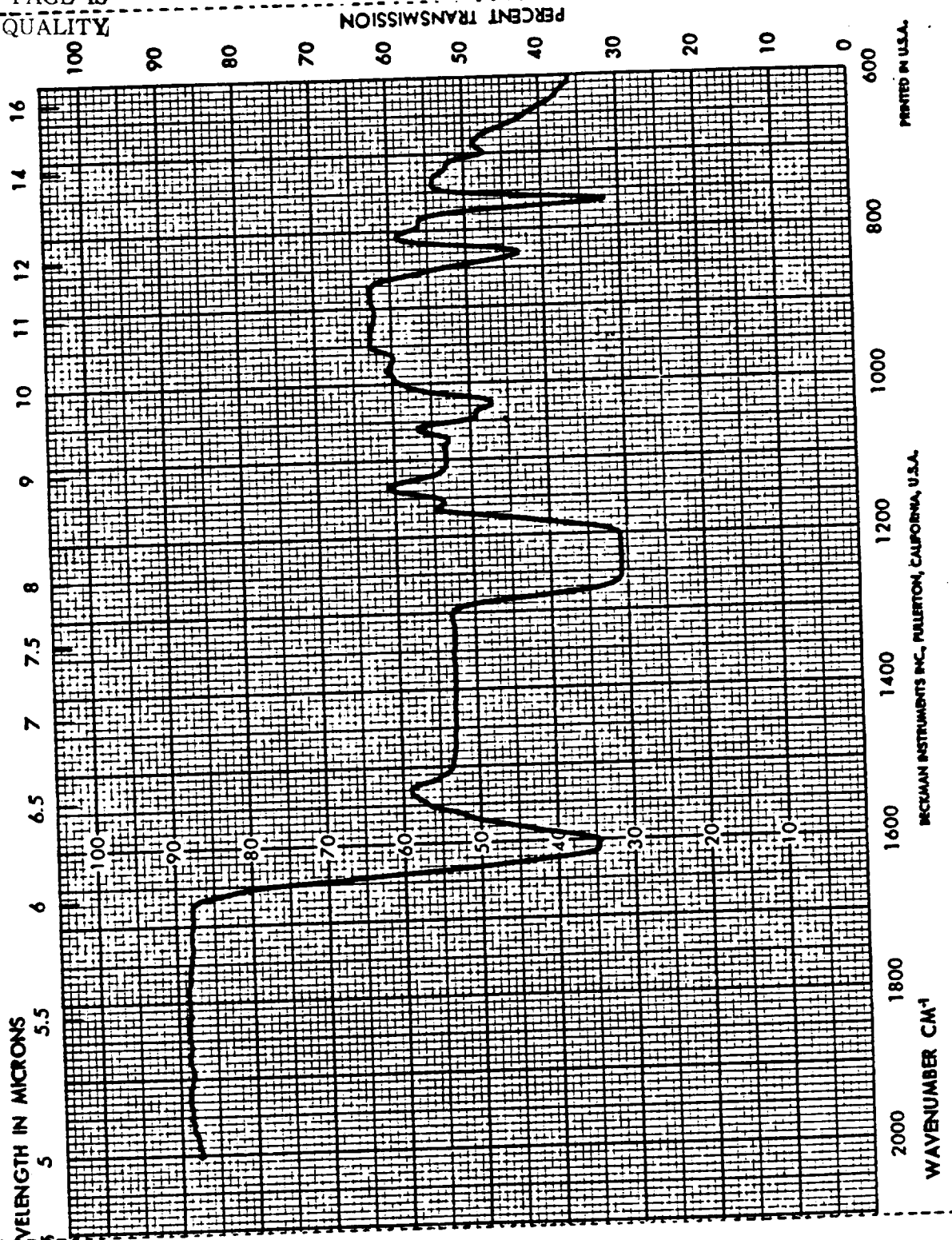
WAVENUMBER CM⁻¹

SPECTRUM NO. 15215
DATE 7-08-86
SAMPLE FM 5055 B
CD2133 # 5T-3
SOURCE _____
STRUCTURE _____
PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PAGE-1
MATERIAL
ANALYST V. MIRANDA

Beckman®INFRARED
SPECTROPHOTOMETER

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CHART 10F



SPECTRUM NO. 15216

DATE 7-08-84

SAMPLE FM 5055 B

CO2133 # E-3

SOURCE _____

STRUCTURE _____

PATH 0.2 mm NaCl

SOLVENT ACETONE

CONCENTRATION 30-50%

PHASE 3

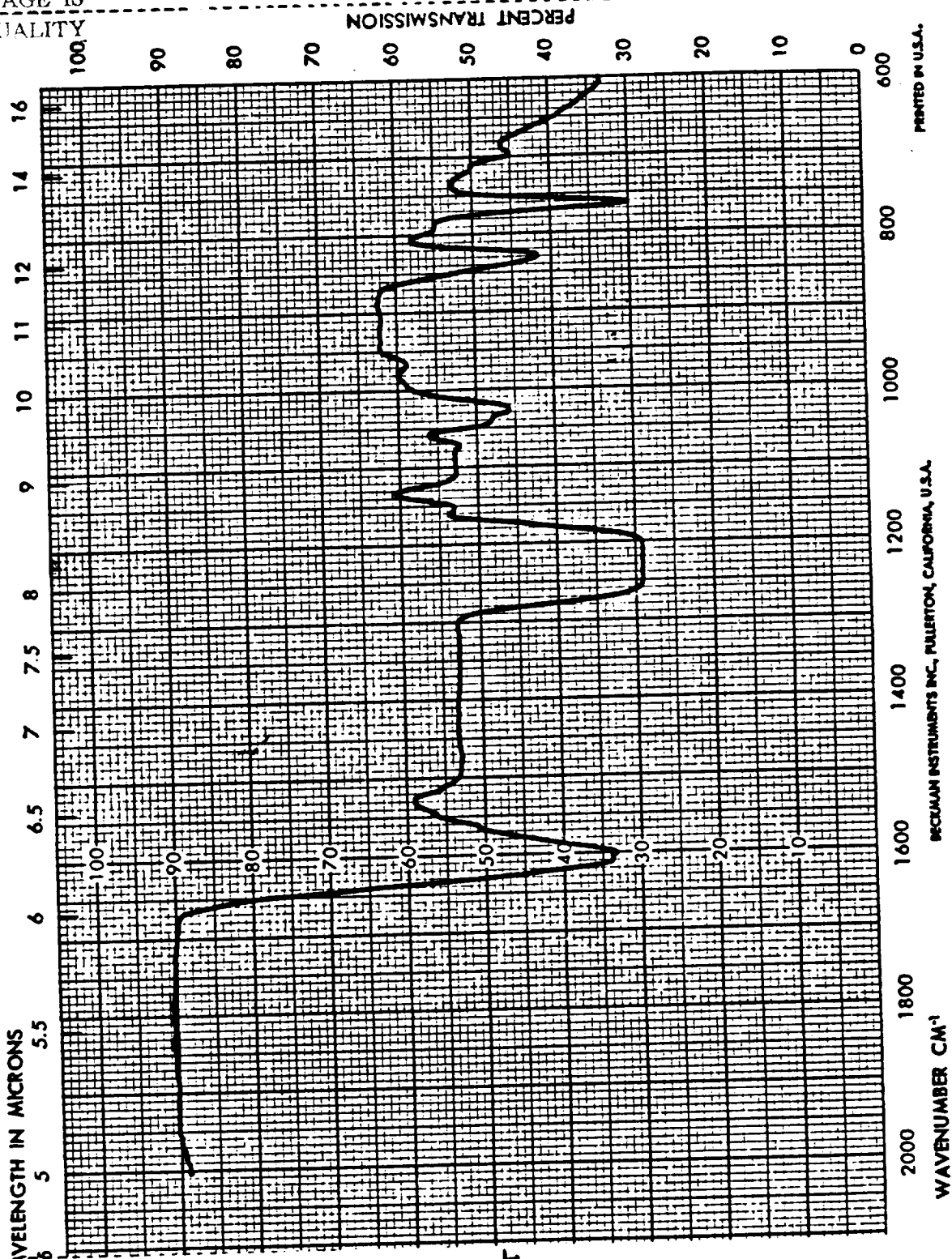
COMMENTS PRE-PREG

MATERIAL _____

ANALYST V. MIRANDA

Beckman®

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SPECTROPHOTOMETER



SPECTRUM NO. 15217
DATE 7-08-86
SAMPLE FM 50560
CO2133 # 514

SOURCE _____
STRUCTURE _____

PATH 0.2 mm NaCl
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL

ANALYST Y. MIRANDA

Beckman®

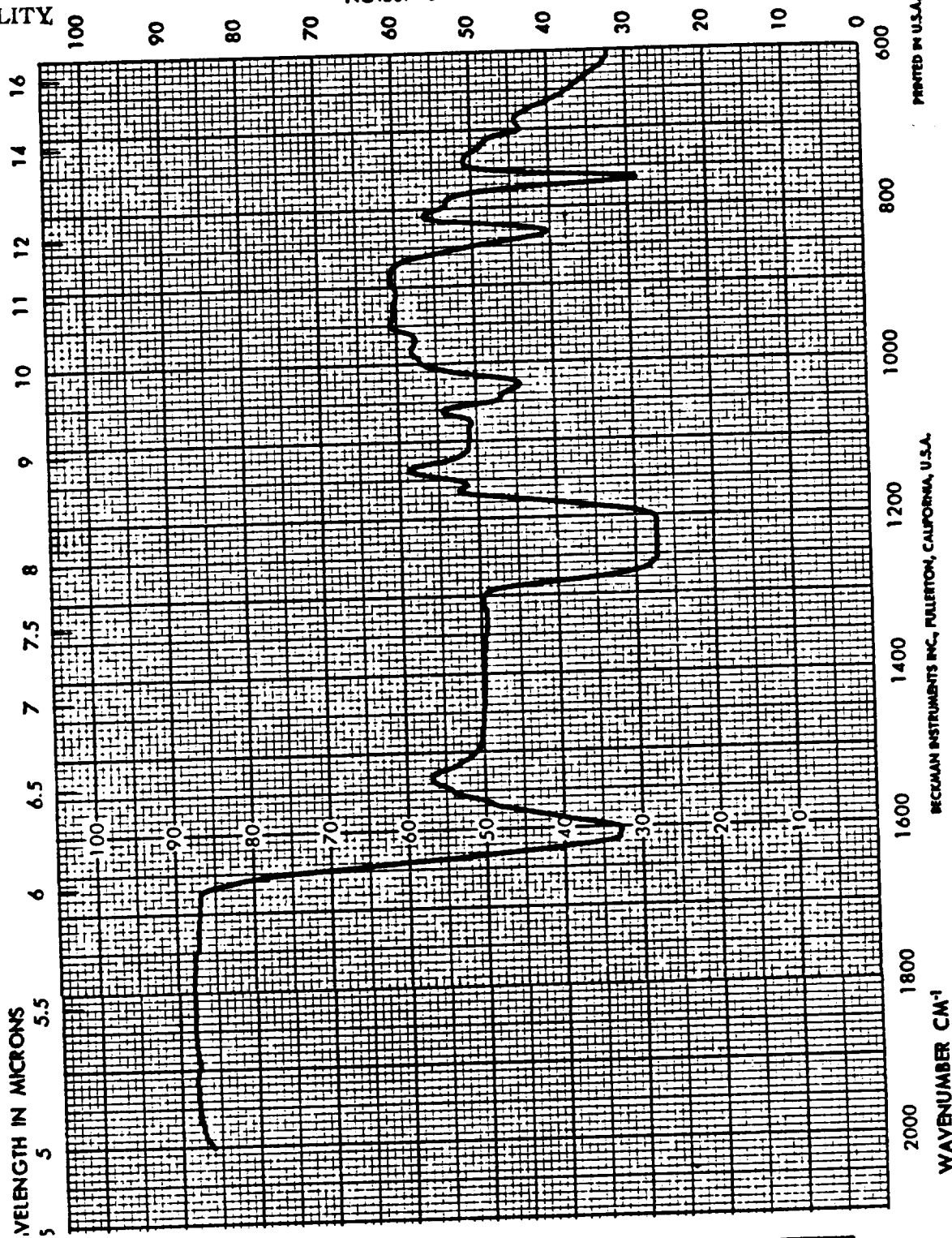
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SPECTROPHOTOMETER

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CHART 100

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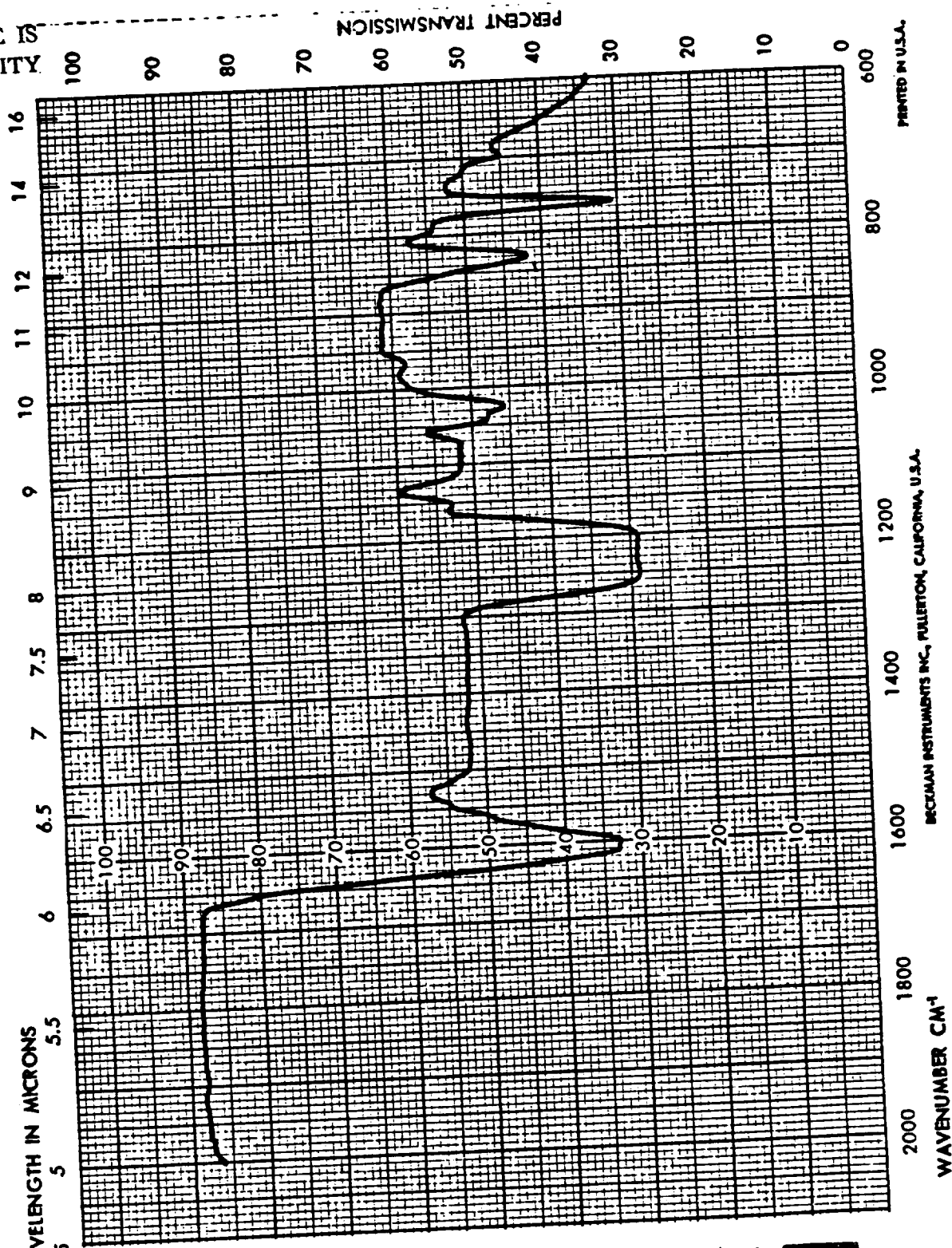
BECKMAN INSTRUMENTS INC., FULLERTON, CALIFORNIA, U.S.A.

SPECTRUM NO. 15210
DATE 7-08-86
SAMPLE FM 50652
CD2133 # E-4
SOURCE _____
STRUCTURE _____

PATH 0.2 mm NaCl
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE S
COMMENTS PRE-PREG
MATERIAL
ANALYST V. MIRANDA

Beckman®

INFRARED
SPECTROPHOTOMETER

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SPECTRUM NO. 15219
 DATE 7-08-84
 SAMPLE FM 5055 B
CD2133 # 5T-5

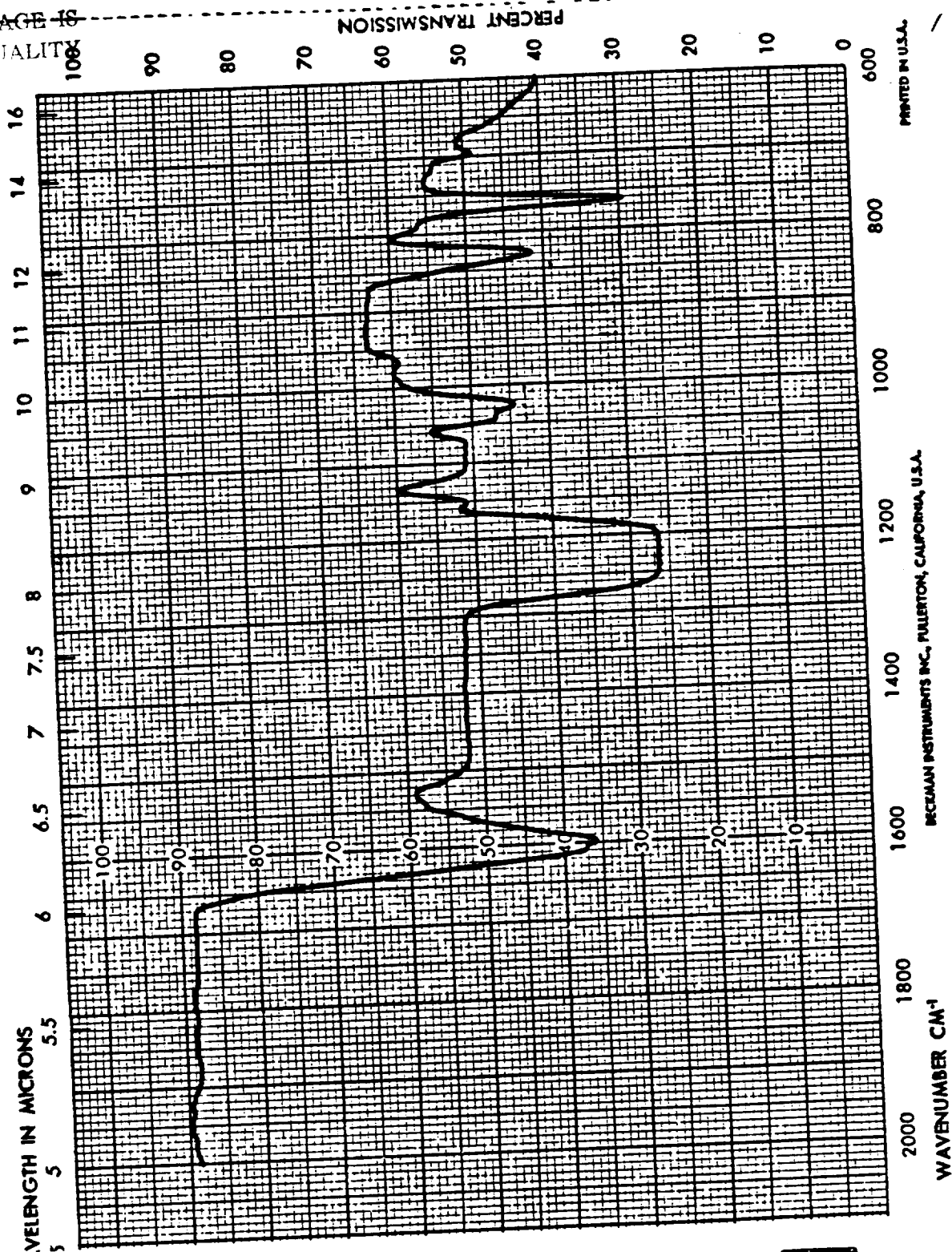
SOURCE _____
 STRUCTURE _____

PATH 0.2 mm NACL
 SOLVENT ACETONE
 CONCENTRATION 30-50%
 PHASE 3
 COMMENTS PRE-PREG
MATERIAL

ANALYST V. MIRANDA

Beckman®

INFRARED
 SPECTROPHOTOMETER

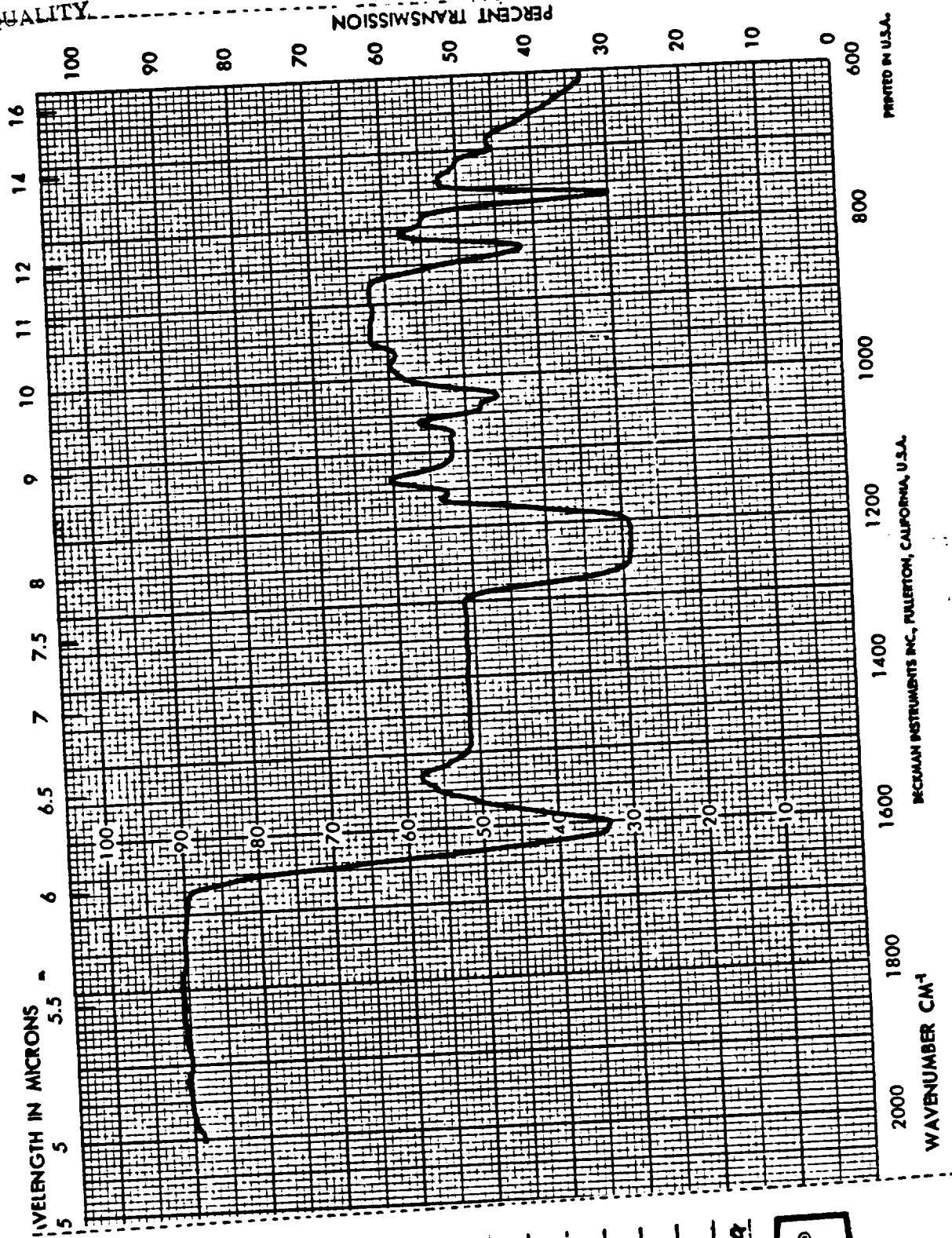
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OF POOR QUALITYSPECTRUM NO. 15220DATE 7-08-66SAMPLE FM 5055 BCO2133 # E-5

SOURCE _____

STRUCTURE _____

PATH 0.2 mm NaClSOLVENT ACETONECONCENTRATION 30-50%PHASE 3COMMENTS PRE-PREGMATERIALANALYST V. MIRANDA**Beckman®**INFRARED
SPECTROPHOTOMETER

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SPECTRUM NO. 15221
DATE 7-00-04
SAMPLE FM 5065 B
CO2133 # 6T-10

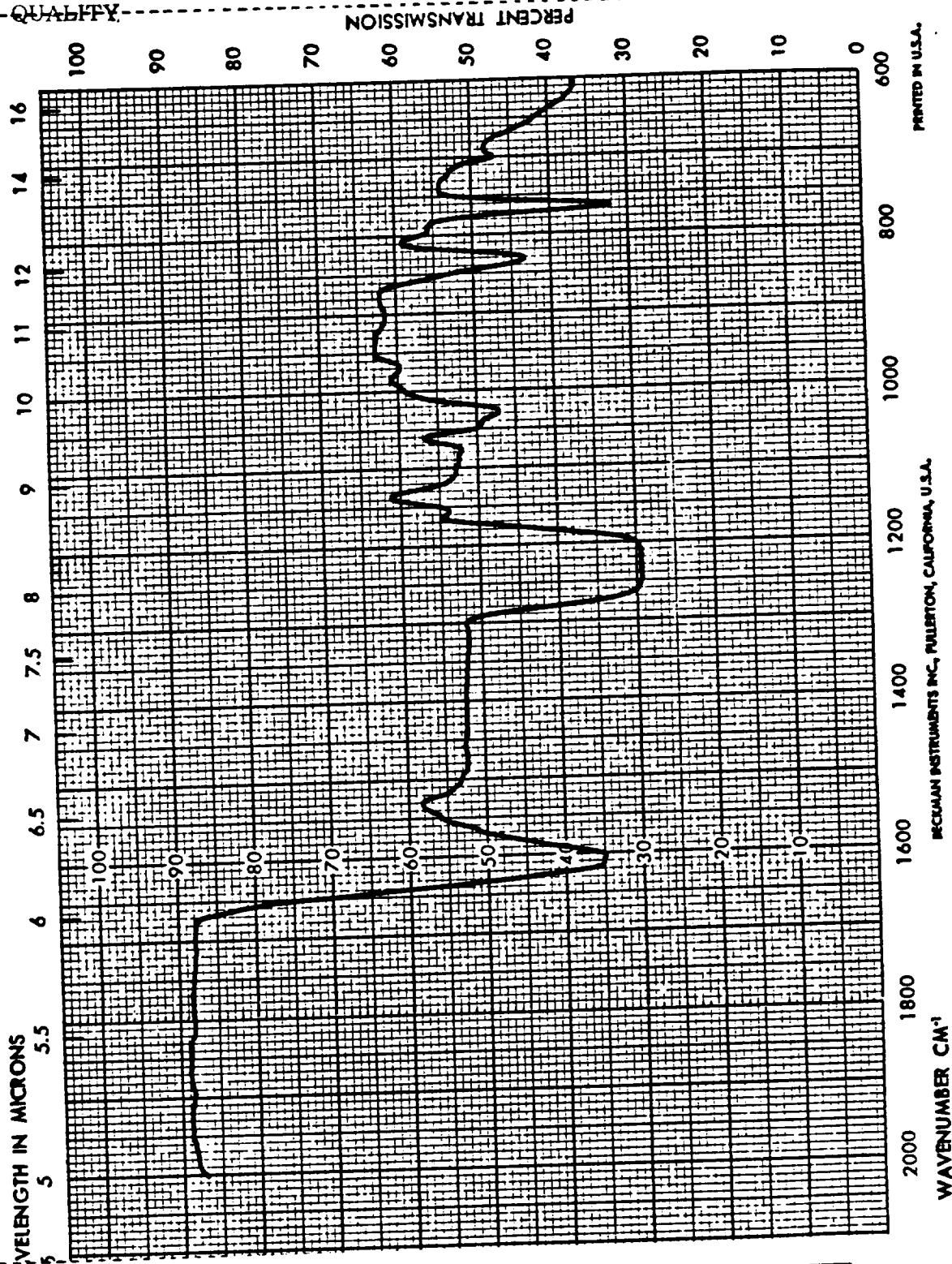
SOURCE _____
STRUCTURE _____

PATH 0.2 mm NaCl
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PRER
MATERIAL

ANALYST V. MIRANDA

Beckman®

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SPECTROPHOTOMETER



SPECTRUM NO. 15222

DATE 7-08-66

SAMPLE FM 5055B

CO2133 # E-6

SOURCE _____

STRUCTURE _____

PATH 0.2 mm NACL

SOLVENT ACETONE

CONCENTRATION 30-50%

PHASE S

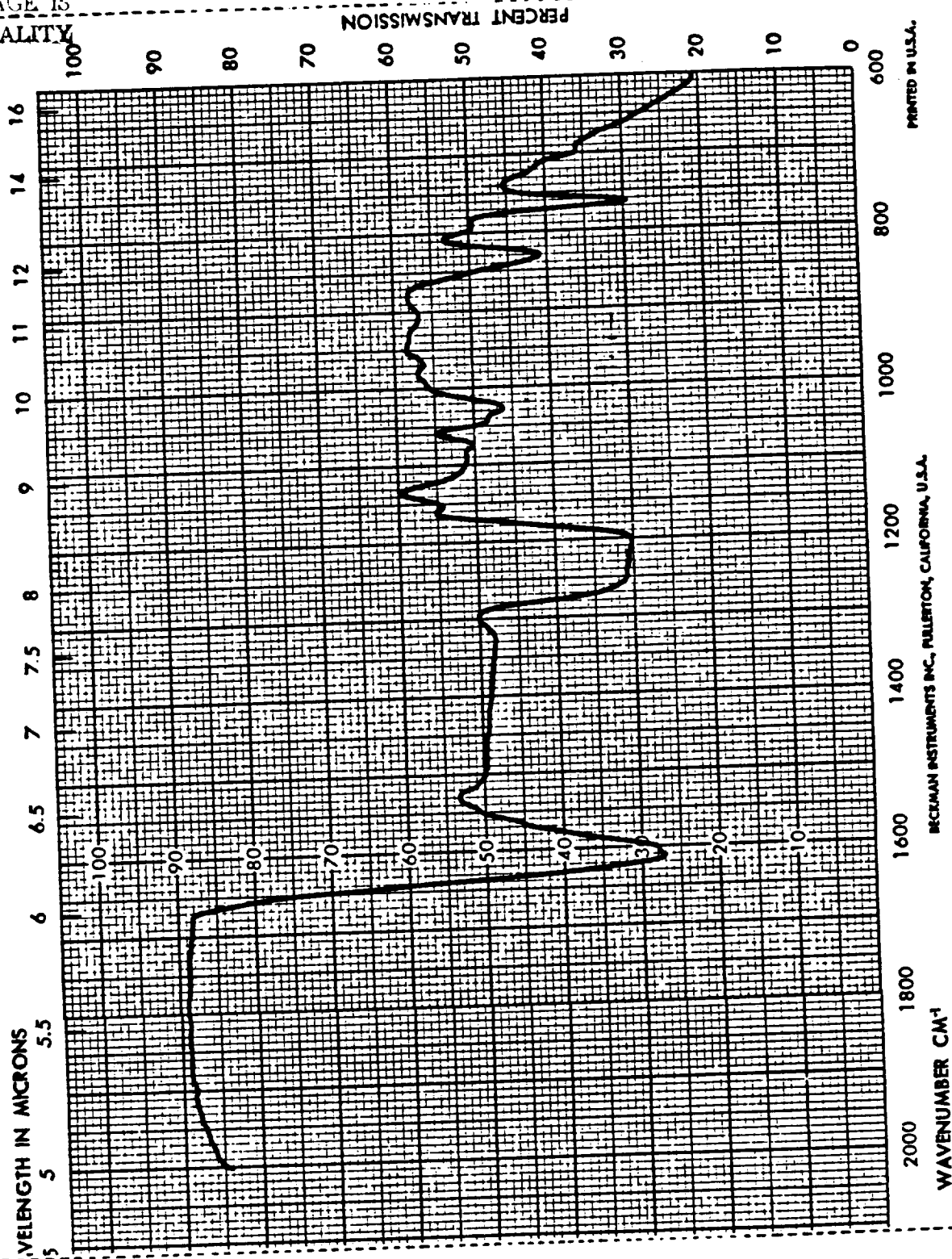
COMMENTS PRE-PREC

MATERIAL

ANALYST Y. MIRANDA

Beckman®

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SPECTROPHOTOMETER

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SPECTRUM NO. 15223DATE 7-08-66SAMPLE FM 50559CD 2133 # 5T-7

SOURCE _____

STRUCTURE _____

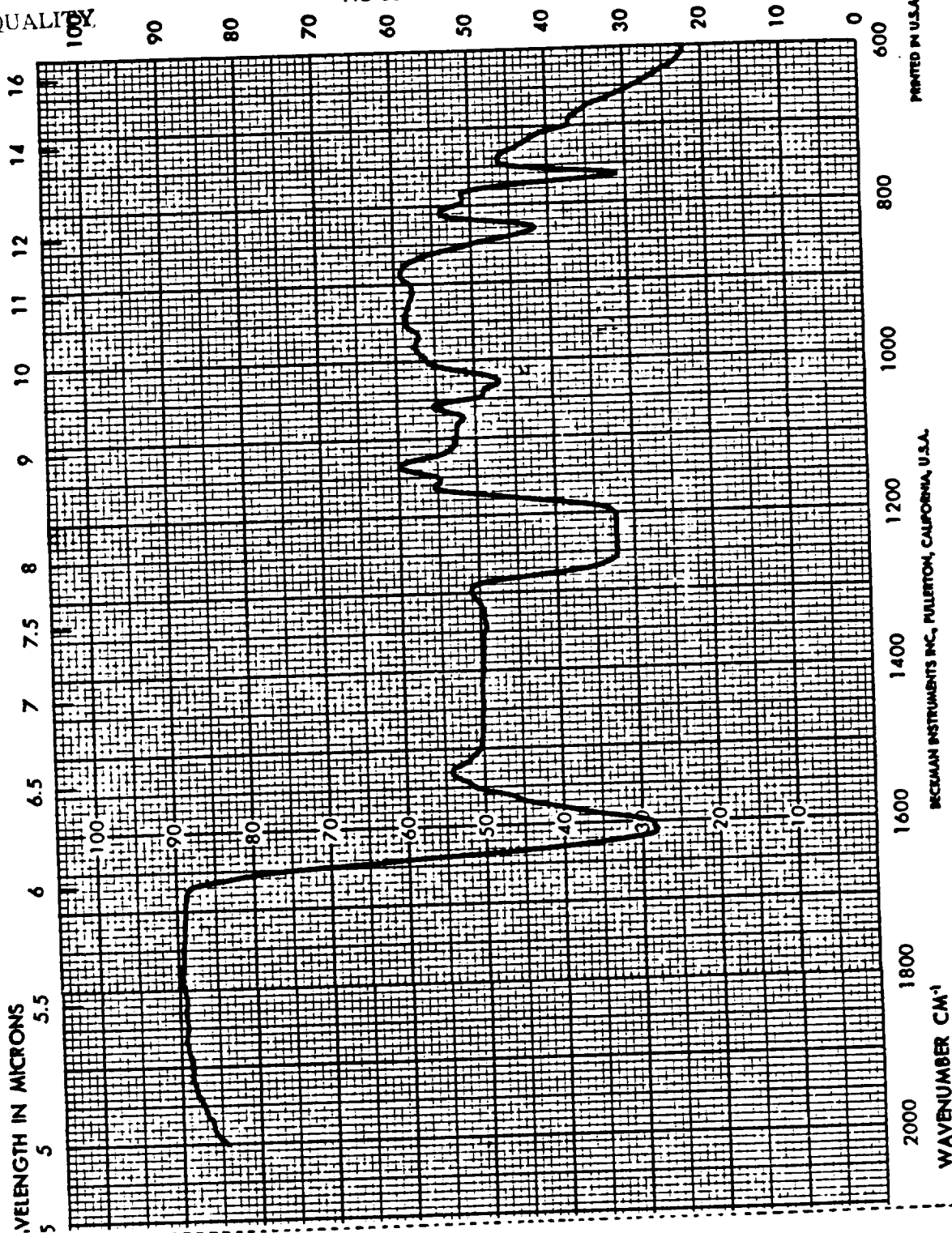
PATH 0.2 mm NACLSOLVENT ACETONECONCENTRATION 90-50%PHASE 3COMMENTS PRE-PREPMATERIALANALYST Y. MIRANDA**Beckman®**INFRARED
SPECTROPHOTOMETER

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PERCENT TRANSMISSION

CHART 10N

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SPECTRUM NO. 15224
DATE 7-08-64
SAMPLE FM 5055 B
CO2133 # E-7
SOURCE _____
STRUCTURE _____

PATH 0.2 mm NACL
SOLVENT ACETONE
CONCENTRATION 30-50%
PHASE 3
COMMENTS PRE-PREG
MATERIAL
ANALYST Y. MIRANDA

Beckman®

INFRARED
SPECTROPHOTOMETER

PART NO. 996088

RUN NO. DATE 9/11/76
 OPERATOR DT
 SAMPLE: CO2133-1-START-(1)
 ATM. PK @ SEP
 FLOW RATE 3.5SLM

T-AXIS
 SCALE: °C/in 30/21
 PROG. RATE: °C/min 1
 HEAT: COOL ISO
 SHIFT: in 0

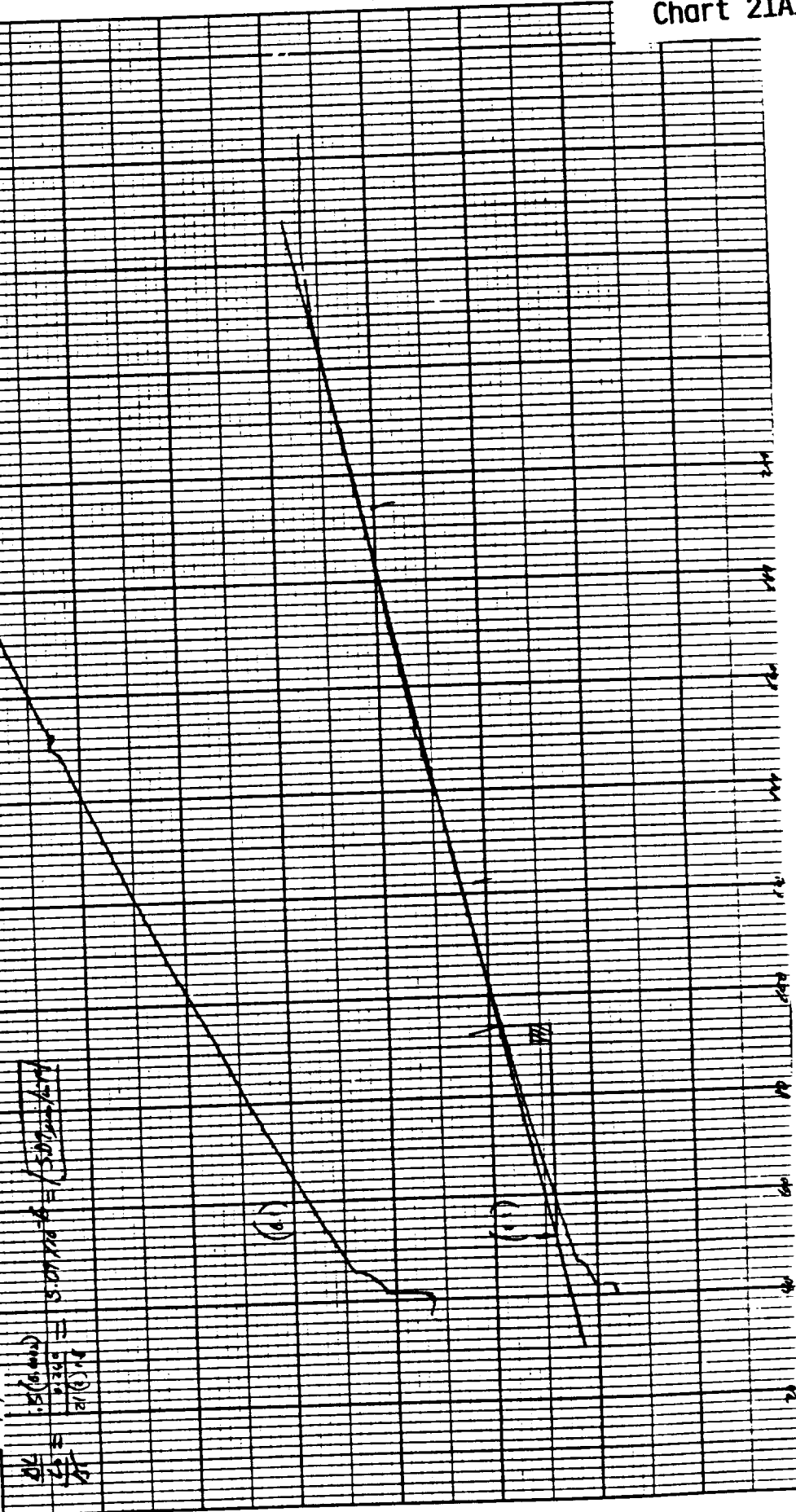
DTA-DSC
 SCALE: °C/in
 (mcal/sec)/in
 WEIGHT: mg
 REFERENCE

TGA
 SCALE: mg/in
 SUPPRESSION: mg
 WEIGHT: mg
 TIME CONST.: sec
 dV: (mg/min)/in

TMA
 SCALE: mile/in 0.1/6.2
 MODE 60/100
 SAMPLE SIZE 0.260
 LOAD 0
 dV: (10X) (mile/min)/in

W/m

$$\frac{W}{L} = \frac{1.5(6.44)}{2(0.1)} = 5.07 \text{ mg/in} = 507 \text{ mg/m}$$



DUPOINT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
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PART NO. 990088

RUN NO. 71 DATE 9/11/86
 OPERATOR 71
 SAMPLE: CO2153-1-SM-2
 ATM. DL @ 50
 FLOW RATE 3.5SLR

T-AXIS
 SCALE, °C/in 50
 PROG. RATE, °C/min 0
 HEAT ✓ COOL 180
 SHIFT, in 0

DTA/DSC

SCALE, °C/in
 (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

TGA

SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dY, (mg/min)/in

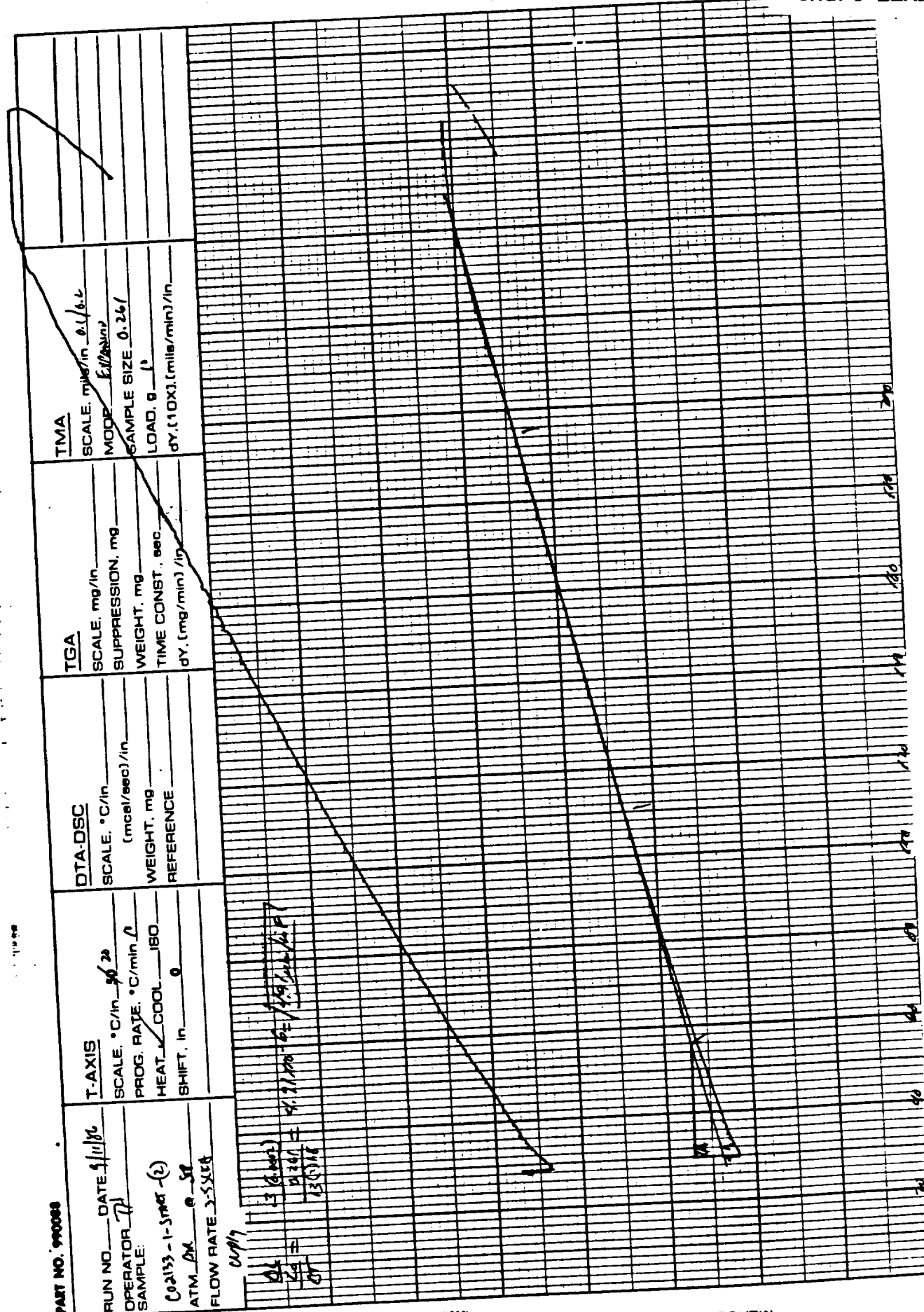
TMA

SCALE, mils/in 0.1/0.2
 MODE Expanding
 SAMPLE SIZE 0.261
 LOAD, g 1
 dY, (10X) (mils/min)/in

DU PONT
 Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
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PART NO. 990088

RUN NO. DATE 9/10/81

OPERATOR JD

SAMPLE: C-3133 - 1-START-(4)

ATM. AIR @ 37

FLOW RATE 3.5XCH

T-AXIS

SCALE, °C/in 50 20

PROG. RATE, °C/min 10

HEAT COOL ISO

SHIFT, in 0

DTA-DSC

SCALE, °C/in

(mcal/sec)/in

WEIGHT, mg

REFERENCE

TGA

SCALE, mg/in

SUPPRESSION, mg

WEIGHT, mg

TIME CONST., sec

dY, (mg/min)/in

TMA

SCALE, mils/in 0.1 0.2

MODE 2/10/10/10

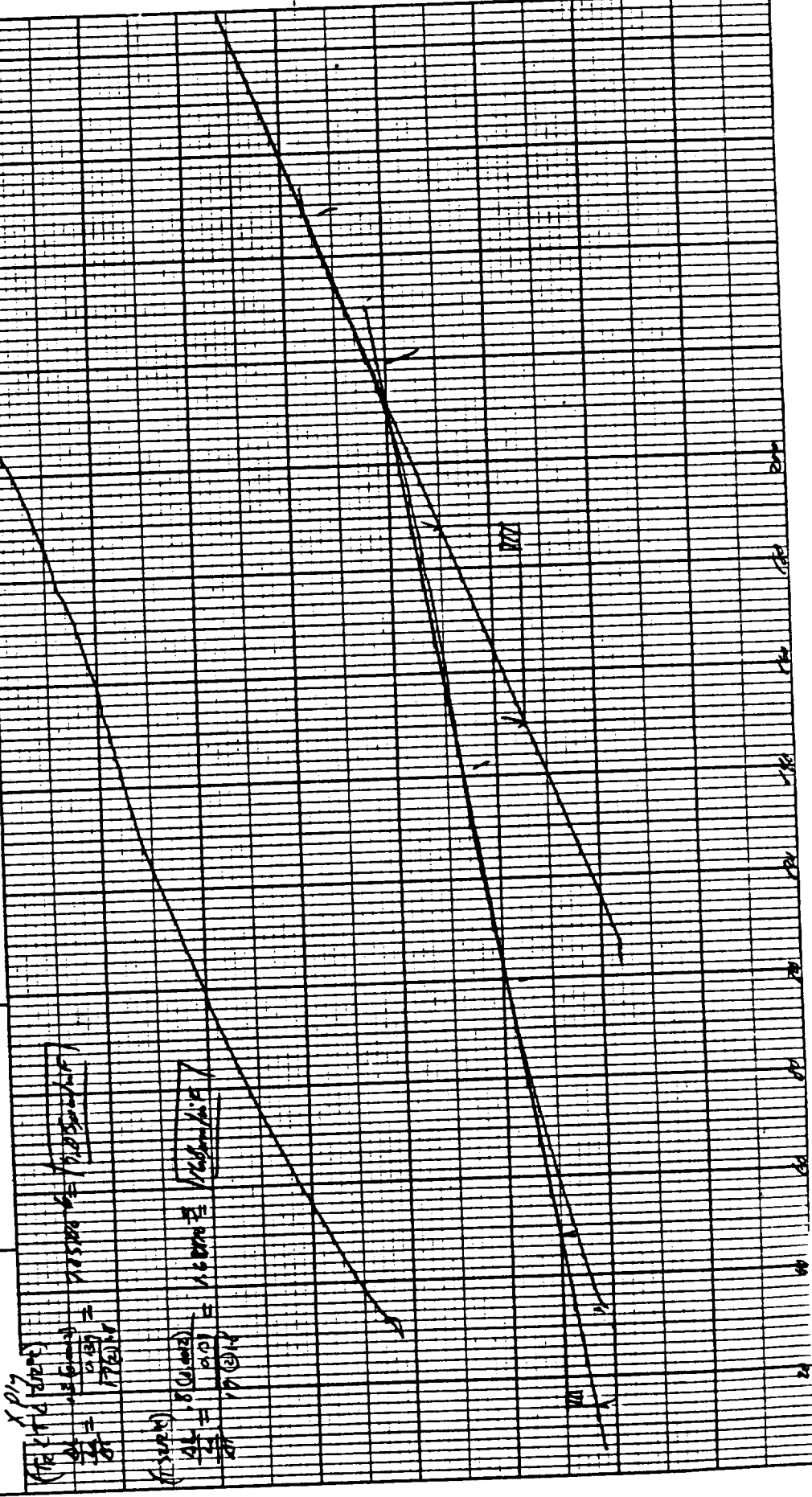
SAMPLE SIZE 0.10g

LOAD, g 10

dY, (10X) (mils/min)/in

$$\frac{dL}{dt} = \frac{1.5 \text{ (mg/min)}}{1.7 \text{ (20) in}} = 1.25 \times 10^{-2} \text{ (mg/min) in}^{-1}$$

$$\frac{dL}{dt} = \frac{1.8 \text{ (0.0023)}}{1.7 \text{ (20) in}} = 1.6 \times 10^{-2} \text{ (mg/min) in}^{-1}$$



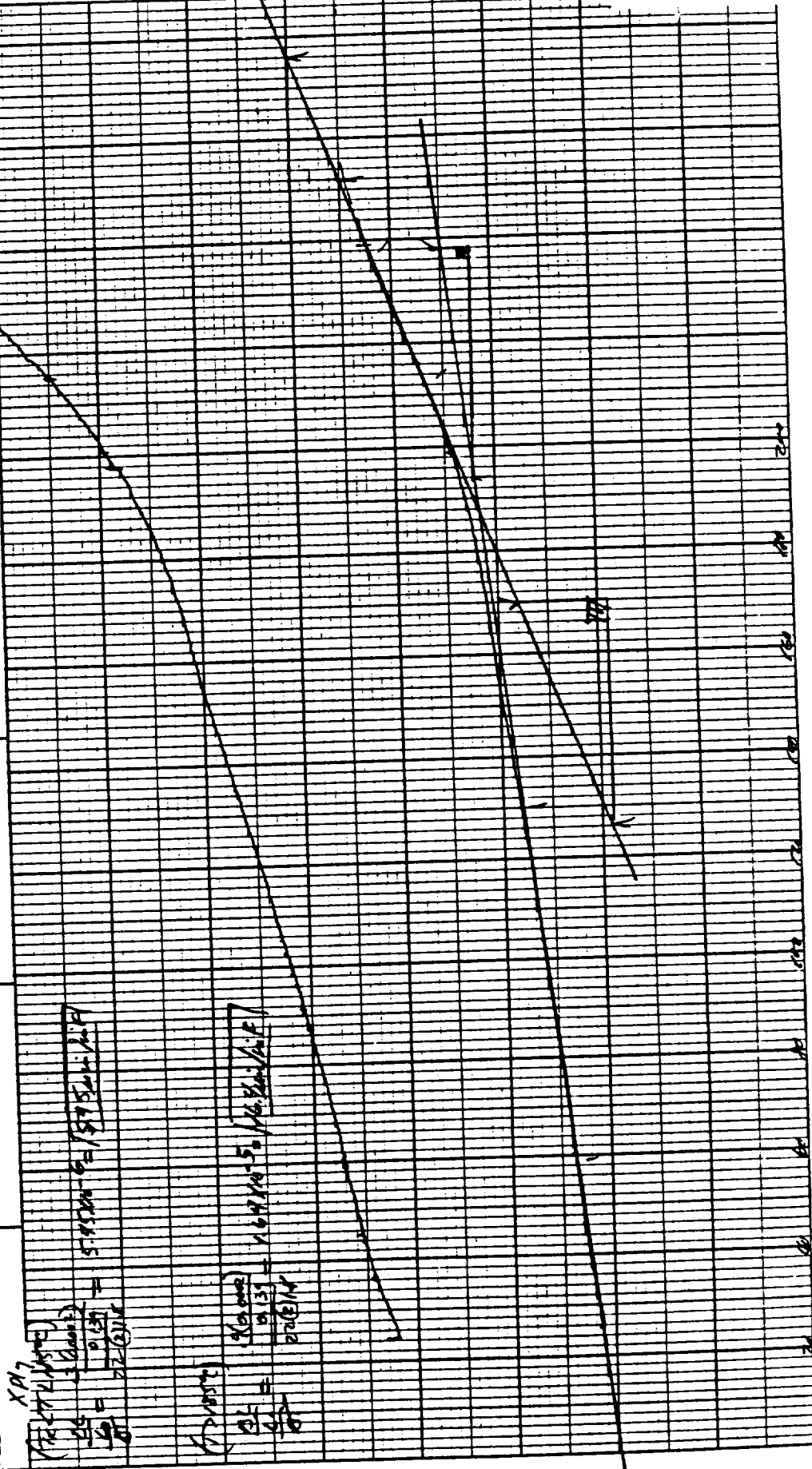
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MEASURED VARIABLE

ORIGINAL PAGE IS OF POOR QUALITY

PART NO. 990088

RUN NO. <u>9/10/66</u> DATE <u>9/10/66</u> OPERATOR <u>TH</u> SAMPLE <u>602133-1-SPART-5</u> ATM. <u>AN</u> <u>0.10</u> FLOW RATE <u>3.5 X 10⁻¹</u>		T-AXIS SCALE, °C/in <u>90/20</u> PROG. RATE, °C/min <u>1</u> HEAT <u>COOL</u> <u>ISO</u> SHIFT, in <u>0</u>		DTA-DSC SCALE, °C/in WEIGHT, mg REFERENCE		TGA SCALE, mg/in SUPPRESSION, mg WEIGHT, mg TIME CONST., sec dY, (mg/min) / in		TMA SCALE, mils/in <u>0.1/0.2</u> MODE <u>EXTRAPOL</u> SAMPLE SIZE <u>0.035</u> LOAD, g <u>10</u> dY, (10X), (mils/min) / in	
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DU PONT Instruments

MEASURED VARIABLE

PART NO. 990088

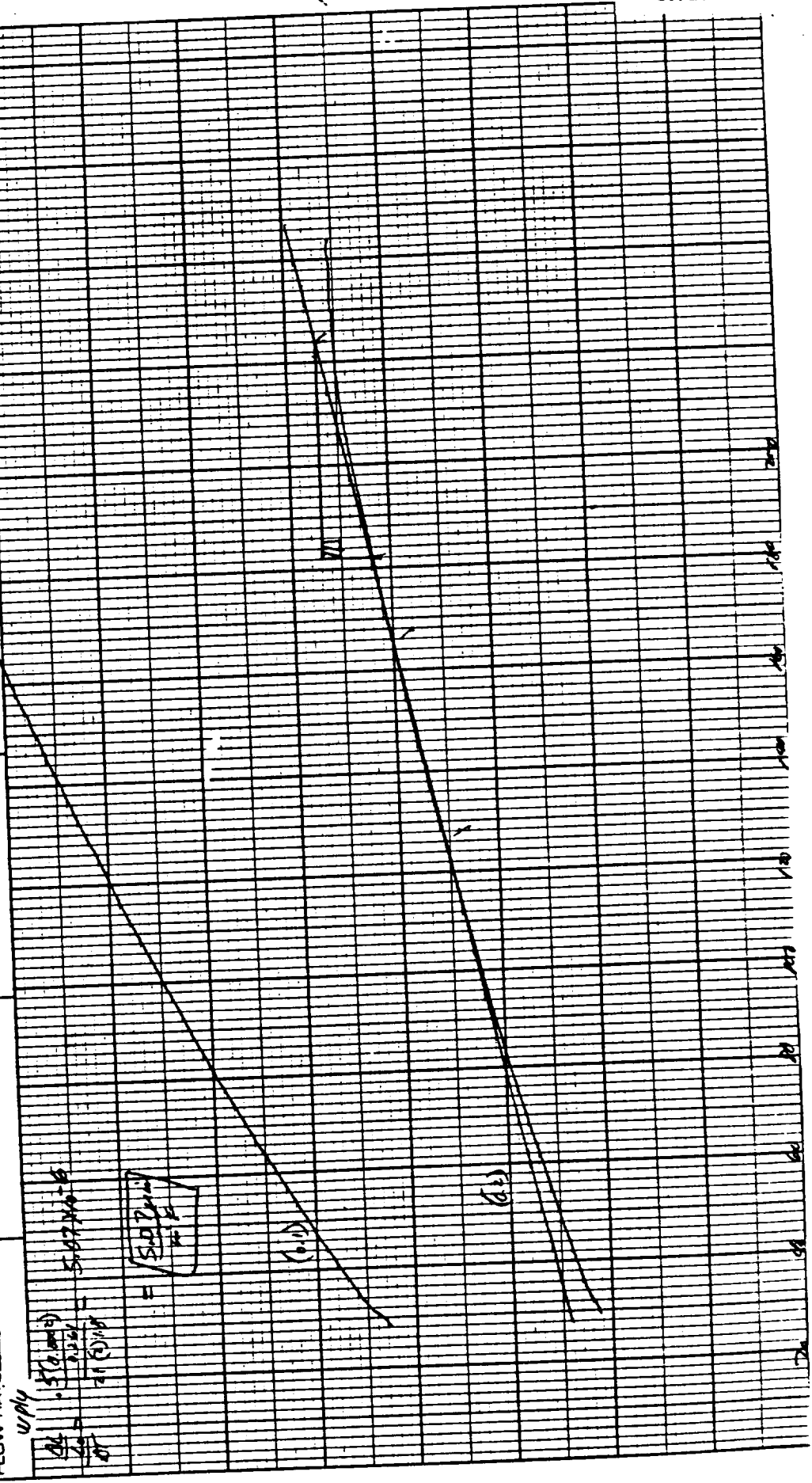
RUN NO. DATE 1/11/74
 OPERATOR TH
 SAMPLE: C-2133 - 1-600 - 61
 ATM. 24 @ 24
 FLOW RATE 3-540

T-AXIS
 SCALE, °C/in. 24
 PROG. RATE, °C/min. 0
 HEAT ✓ COOL ISO
 SHIFT, in. 0

DTA-OSC
 SCALE, °C/in. (mcal/sec)/in.
 WEIGHT, mg
 REFERENCE

TGA
 SCALE, mg/in.
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dY, (mg/min)/in.

TMA
 SCALE, mils/in. 0.1/10
 MODE 6.2/10/20
 SAMPLE SIZE 0.264
 LOAD, g 1
 dY, (10X), (mils/min)/in.



DU PONT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
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PART NO. 970088

RUN NO. <u>9/11/16</u> DATE <u>9/11/16</u> OPERATOR <u>TR</u> SAMPLE <u>Ca2133-1-End (-2)</u> ATM. PR. <u>@ STP</u> FLOW RATE <u>35 SCFH</u>		T-AXIS SCALE: °C/in <u>50</u> PROG. RATE: °C/min <u>10</u> HEAT/COOL: <u>ISO</u> SHIFT: in <u>0</u>		DTA-DSC SCALE: °C/in <u>(mcal/sec)/in</u> WEIGHT: mg <u>REFERENCE</u>		TGA SCALE: mg/in <u>10</u> SUPPRESSION: mg <u>10</u> WEIGHT: mg <u>10</u> TIME CONST.: sec <u>10</u> dV: (mg/min)/in <u>10</u>		TMA SCALE: mil/in <u>10</u> MODE: <u>EXPANSION</u> SAMPLE SIZE: <u>0.261</u> LOAD: g <u>10</u> dV: (10X) (mils/min)/in <u>10</u>	
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$\frac{dV}{dV} = \frac{51.6 \text{ mg}}{0.261} = 197.7 \text{ mg/in}$
 $\frac{dV}{dV} = \frac{51.6 \text{ mg}}{0.261} = 197.7 \text{ mg/in}$

DUPOINT Instruments

MEASURED VARIABLE

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PART NO. 990088

RUN NO. DATE 2/10/86
 OPERATOR TH
 SAMPLE: C0213-1-EXP (4)
 ATM. 240 0 500
 FLOW RATE 3.5 L/H

T-AXIS
 SCALE, °C/in 30/24
 PROG. RATE, °C/min 10
 HEAT / COOL 180
 SHIFT, in 0

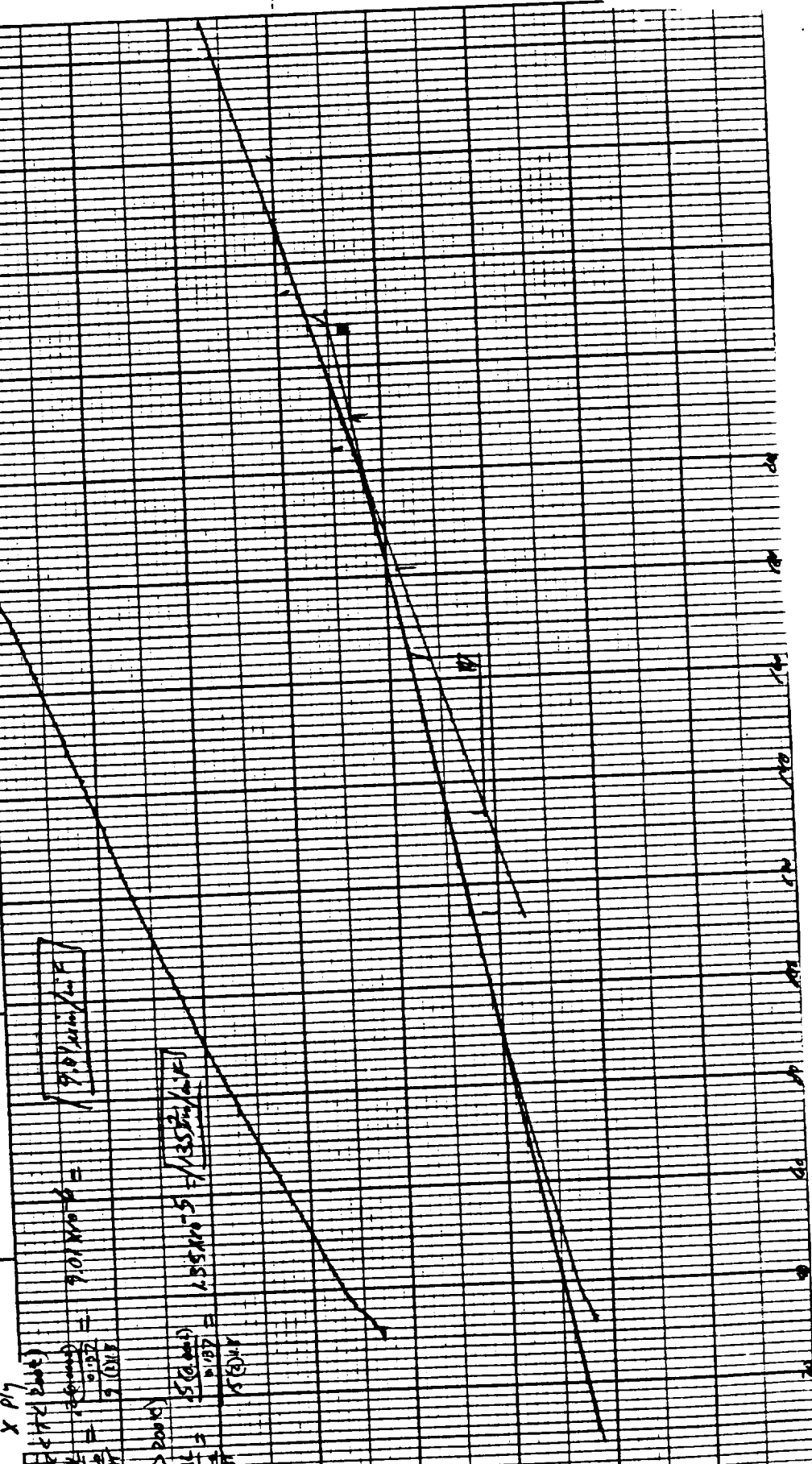
DTA-DSC
 SCALE, °C/in (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

TGA
 SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dV, (mg/min)/in

TMA
 SCALE, mils/in 0.1/0.2
 MODE 100000
 SAMPLE SIZE 0.137
 LOAD, g 10
 dV, (10X), (mils/min)/in

$\frac{dL}{dt} = \frac{3.5 \text{ L/H}}{3600 \text{ s/H}} = 9.72 \times 10^{-4} \text{ L/s}$

$\frac{dL}{dt} = \frac{3.5 \text{ L/H}}{3600 \text{ s/H}} = 9.72 \times 10^{-4} \text{ L/s}$



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MEASURED VARIABLE

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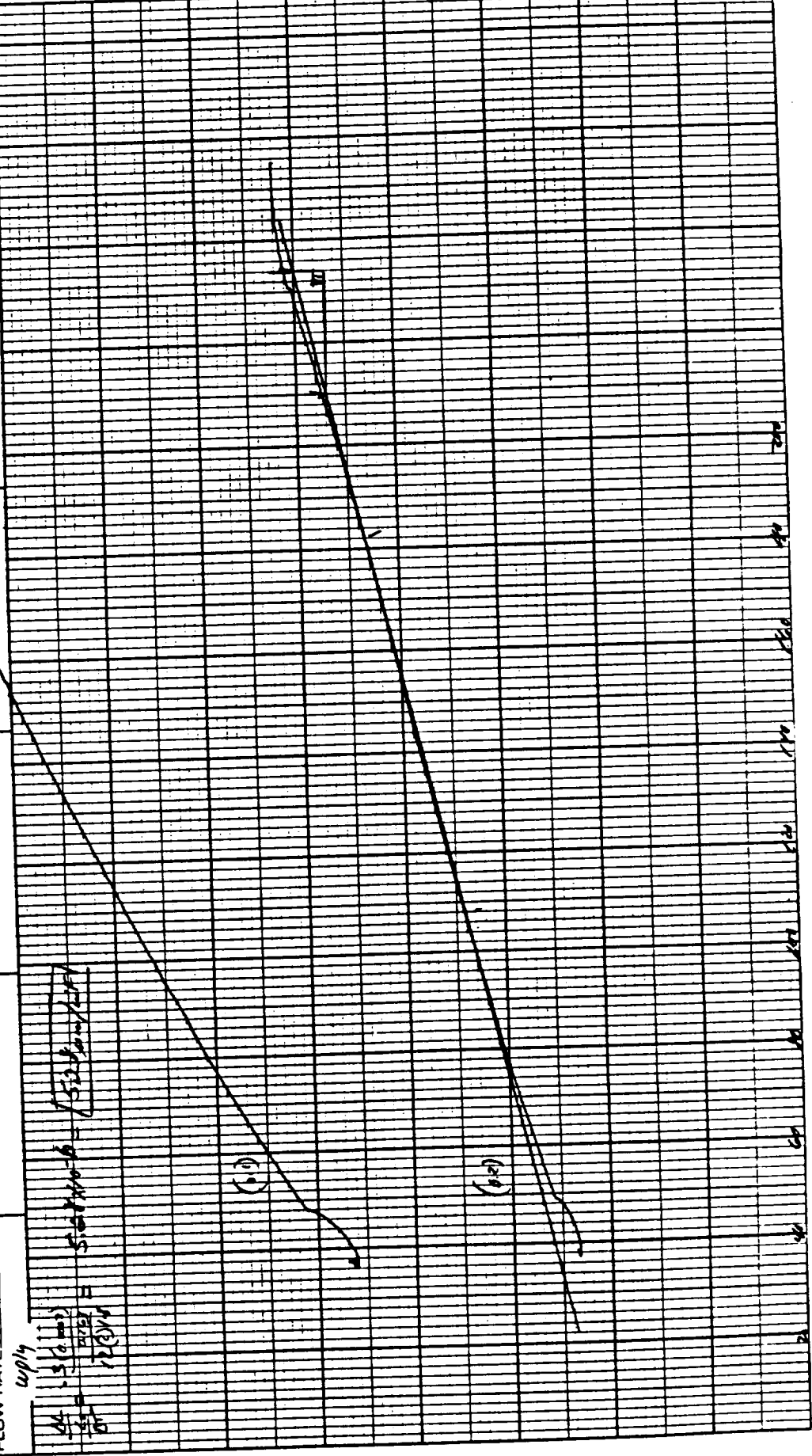
PART NO. 990008

PART NO. 990088 RUN NO. <u>9/10/16</u> OPERATOR <u>DA</u> SAMPLE: <u>Co₂133-1-500-5</u> ATM. <u>24</u> <u>9</u> <u>57P</u> FLOW RATE <u>3-5.5 L/min</u>		T-AXIS SCALE, °C/in. <u>90/20</u> PROG. RATE, °C/min <u>0</u> HEAT <input checked="" type="checkbox"/> COOL <u>180</u> SHIFT, in. <u>0</u>		DTA-DSC SCALE, °C/in. <u>(mcal/sec)/in.</u> WEIGHT, mg <u>180</u> REFERENCE <u>180</u>		TGA SCALE, mg/in. <u>100/10</u> SUPPRESSION, mg <u>100</u> WEIGHT, mg <u>100</u> TIME CONST., sec <u>100</u> dY, (mg/min)/in. <u>100</u>		TMA SCALE, mils/in. <u>0.1/1.1</u> MODE <u>EXPANSION</u> SAMPLE SIZE <u>0.127</u> LOAD, g <u>10</u> dY, (10X)/(mils/min)/in. <u>100</u>	
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$\frac{dH}{dT} = \frac{500 \text{ (mcal)}}{100 \text{ (mg)}} = 5 \text{ (mcal/mg)}$
 $\frac{dH}{dT} = \frac{500 \text{ (mcal)}}{100 \text{ (mg)}} = 5 \text{ (mcal/mg)}$

PART NO. 990088

RUN NO <u>1114</u> DATE <u>1/11/74</u> OPERATOR <u>CH</u> SAMPLE <u>CO2133-2-3 mar-61</u> ATM <u>44</u> @ <u>STP</u> FLOW RATE <u>3.5509</u>		T-Axis SCALE °C/in <u>20</u> PROG. RATE °C/min <u>1</u> HEAT <u>COOL</u> <u>ISO</u> SHIFT in <u>0</u>		DTA-DSC SCALE °C/in <u>(moel/sec)/in</u> WEIGHT mg <u>REFERENCE</u>		TGA SCALE mg/in <u>100</u> SUPPRESSION mg <u>100</u> WEIGHT mg <u>100</u> TIME CONST. sec <u>100</u> dY (mg/min)/in <u>100</u>		TMA SCALE mils/in <u>0.162</u> MODE <u>(10000)</u> SAMPLE SIZE <u>0.263</u> LOAD g <u>10</u> dY (10X) (mils/min)/in <u>100</u>	
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RUN NO. _____ DATE 7/11/86
OPERATOR PT
SAMPLE: C02133-2-SAMP(2)
ATM 406 @ 30
FLOW RATE 3-5460

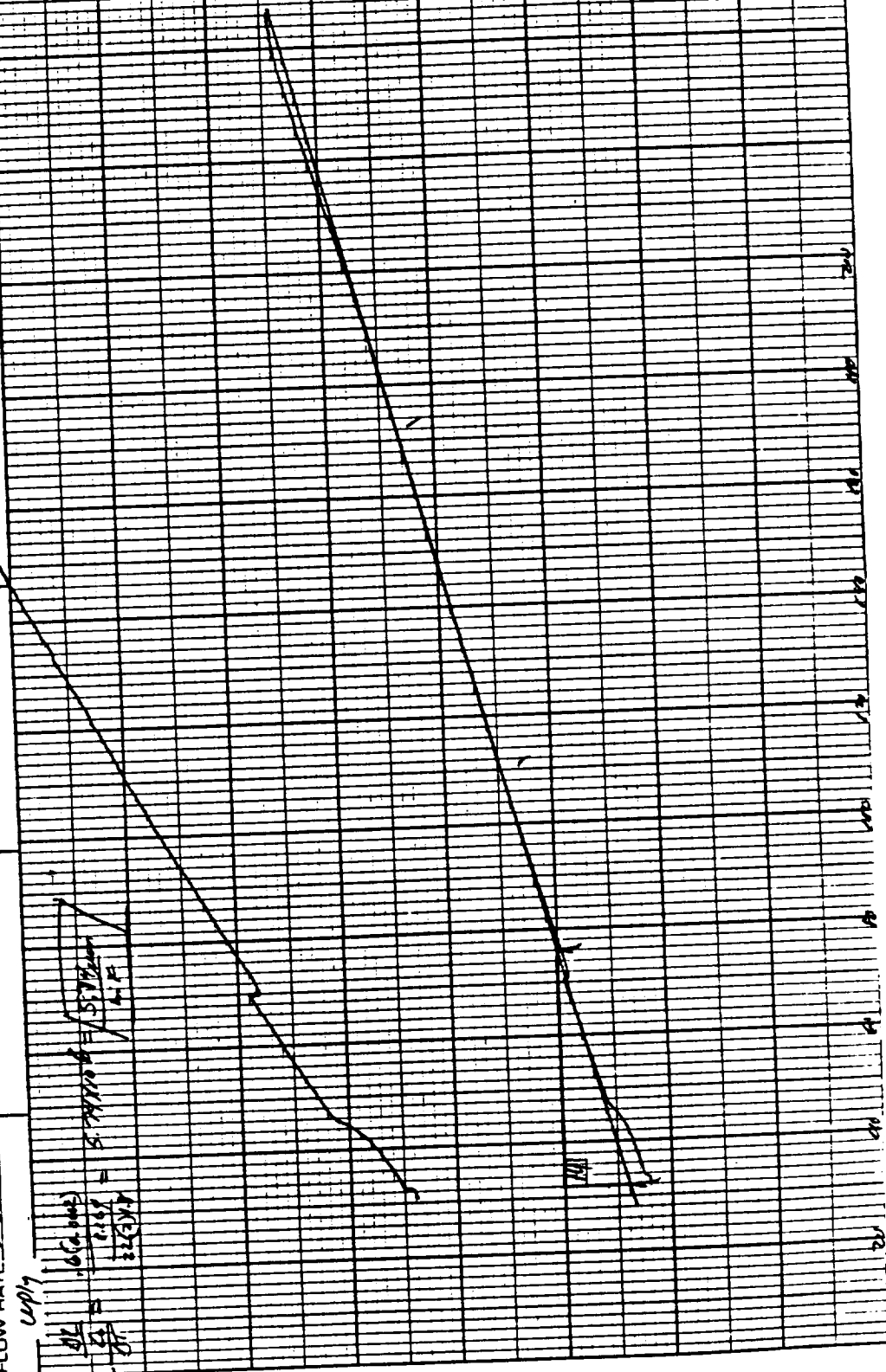
T-AXIS
SCALE, °C/in. 50
PROG. RATE, °C/min 10
HEAT ☒ COOL ISO
SHIFT, in. 0

DTA-DSC
SCALE, °C/in.
(mcal/sec)
WEIGHT, mg
REFERENCE

[illegible]

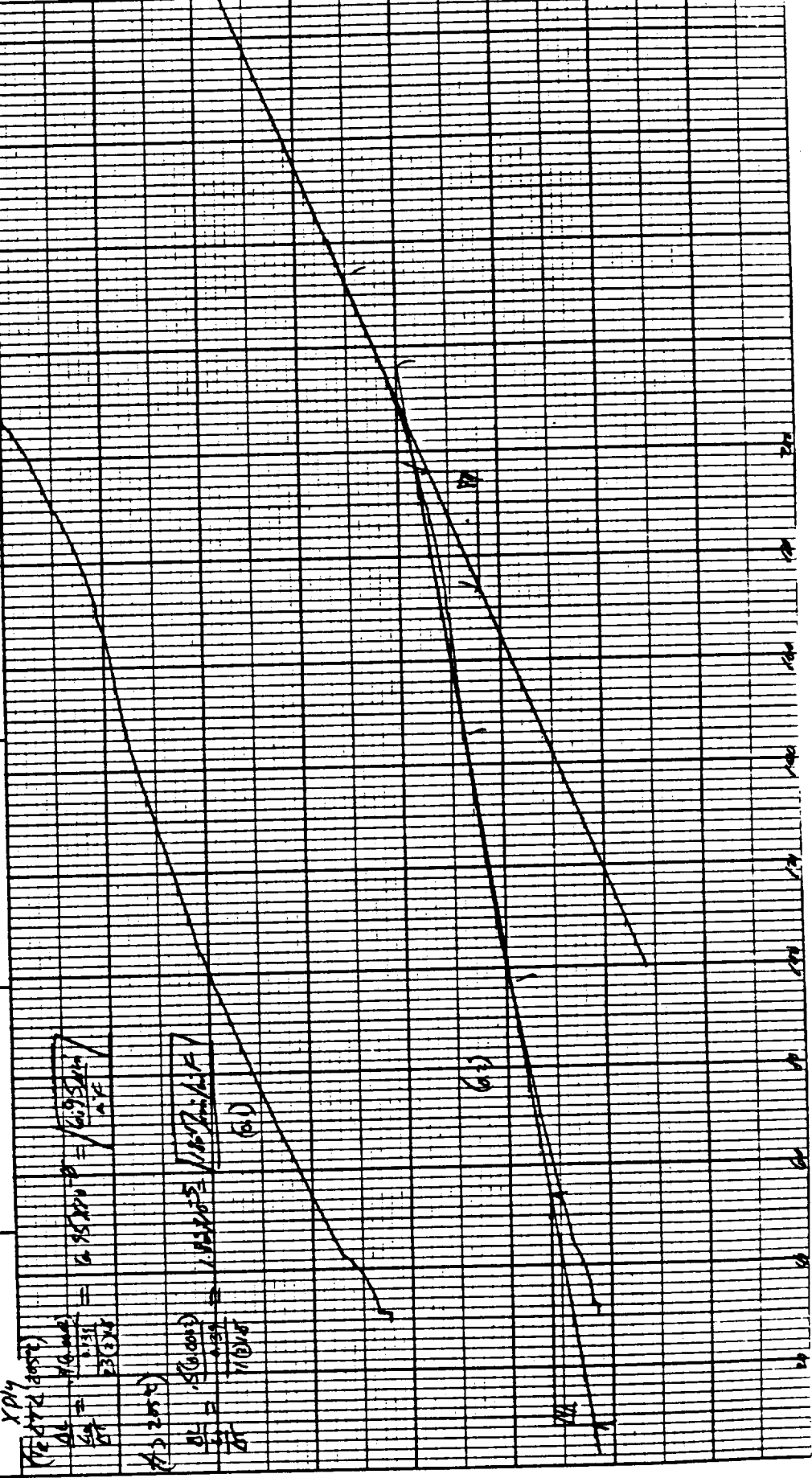
TGA
SCALE, mg/in
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dy (mg/min) / in

TMA
SCALE, mils/in 6.1/0.2
MODE *EXTASW*
SAMPLE SIZE 0.264
LOAD, g 10
dy, (10X), (mils/min)/in



PART NO. 990088

RUN NO. <u>DATE 9/14/16</u> OPERATOR <u>JD</u> SAMPLE: <u>CO2I33-2-START-(4)</u> ATM. <u>OK</u> @ <u>578</u> FLOW RATE <u>1.5 L/min</u>		T-AXIS SCALE: °C/in. <u>96.20</u> PROG. RATE: °C/min <u>10</u> HEAT <u>COOL</u> <u>ISO</u> SHIFT: in. <u>0</u>		DTA-DSC SCALE: °C/in. <u>(mcal/sec)/in</u> WEIGHT, mg REFERENCE		TGA SCALE, mg/in SUPPRESSION, mg WEIGHT, mg TIME CONST., sec. <u>30</u> dY, (mg/min) / in		TMA SCALE, mils/in <u>0.1/6.2</u> MODE <u>EXTENSIVE</u> SAMPLE SIZE <u>0.131</u> LOAD, g <u>1</u> dY, (10X), (mils/min) / in	
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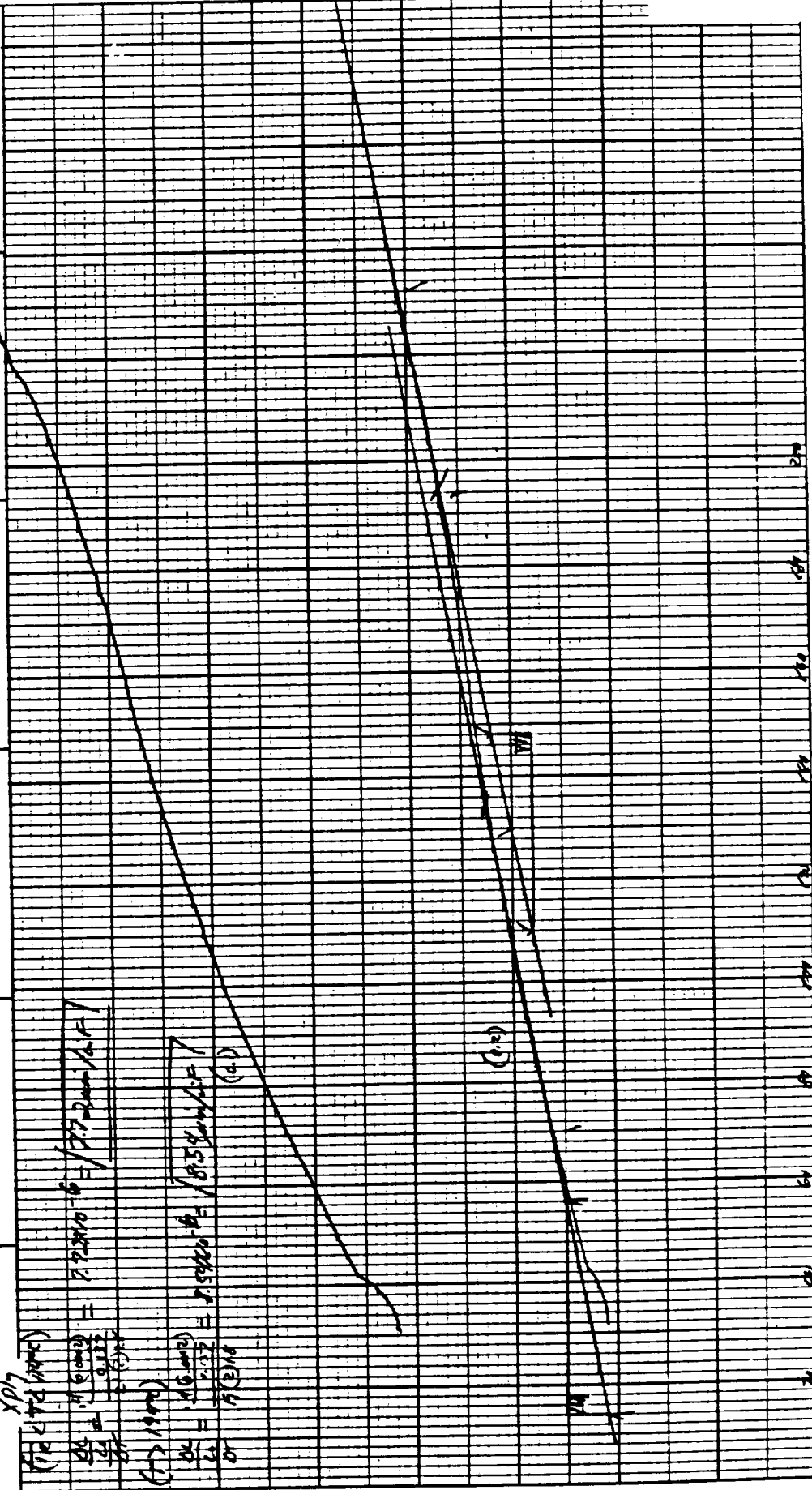


MEASURED VARIABLE

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PART NO. 990088

RUN NO. <u>DATE 9/10/84</u> OPERATOR <u>TH</u> SAMPLE: <u>CO2133 - 2 - STRET-5</u> ATM <u>400</u> @ <u>370</u> FLOW RATE <u>1-5/10</u>		T-AXIS SCALE: °C/in <u>50 20</u> PROG. RATE: °C/min <u>0</u> HEAT <u>✓</u> COOL <u>180</u> SHIFT: in <u>0</u>		DTA-DSC SCALE: °C/in <u> </u> (mcal/sec)/in <u> </u> WEIGHT: mg <u> </u> REFERENCE <u> </u>		TGA SCALE: mg/in <u> </u> SUPPRESSION: mg <u> </u> WEIGHT: mg <u> </u> TIME CONST: sec <u> </u> dY: (mg/min)/in <u> </u>		TMA SCALE: mils/in <u>0.1/0.2</u> MODE <u>EXPANSION</u> SAMPLE SIZE <u>0.137</u> LOAD: g <u>10</u> dY: (10X) (mils/min)/in <u> </u>	
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MEASURED VARIABLE

PART NO. 990088

RUN NO. 71116
 OPERATOR U
 SAMPLE C02133-2-500-1
 ATM At @ ST
 FLOW RATE 1.544

T-AXIS
 SCALE: °C/in 50/20
 PROG. RATE: °C/min 1
 HEAT COOL ISO
 SHIFT: in 0

DTA-DSC

SCALE: °C/in
 (mcal/sec)/in
 WEIGHT: mg
 REFERENCE

TGA

SCALE: mg/in
 SUPPRESSION: mg
 WEIGHT: mg
 TIME CONST.: sec
 dY: (mg/min)/in

TMA

SCALE: mils/in 0.1/0.1
 MODE EXPANS
 SAMPLE SIZE 0.264
 LOAD: g 0
 dY: (10X) (mils/min)/in

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 Instruments

MEASURED VARIABLE

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$$\frac{dL}{dT} = \frac{5.74 \times 10^{-6}}{0.13306} = 5.74 \times 10^{-6} \text{ (mils/min/deg)}$$

Wt 112

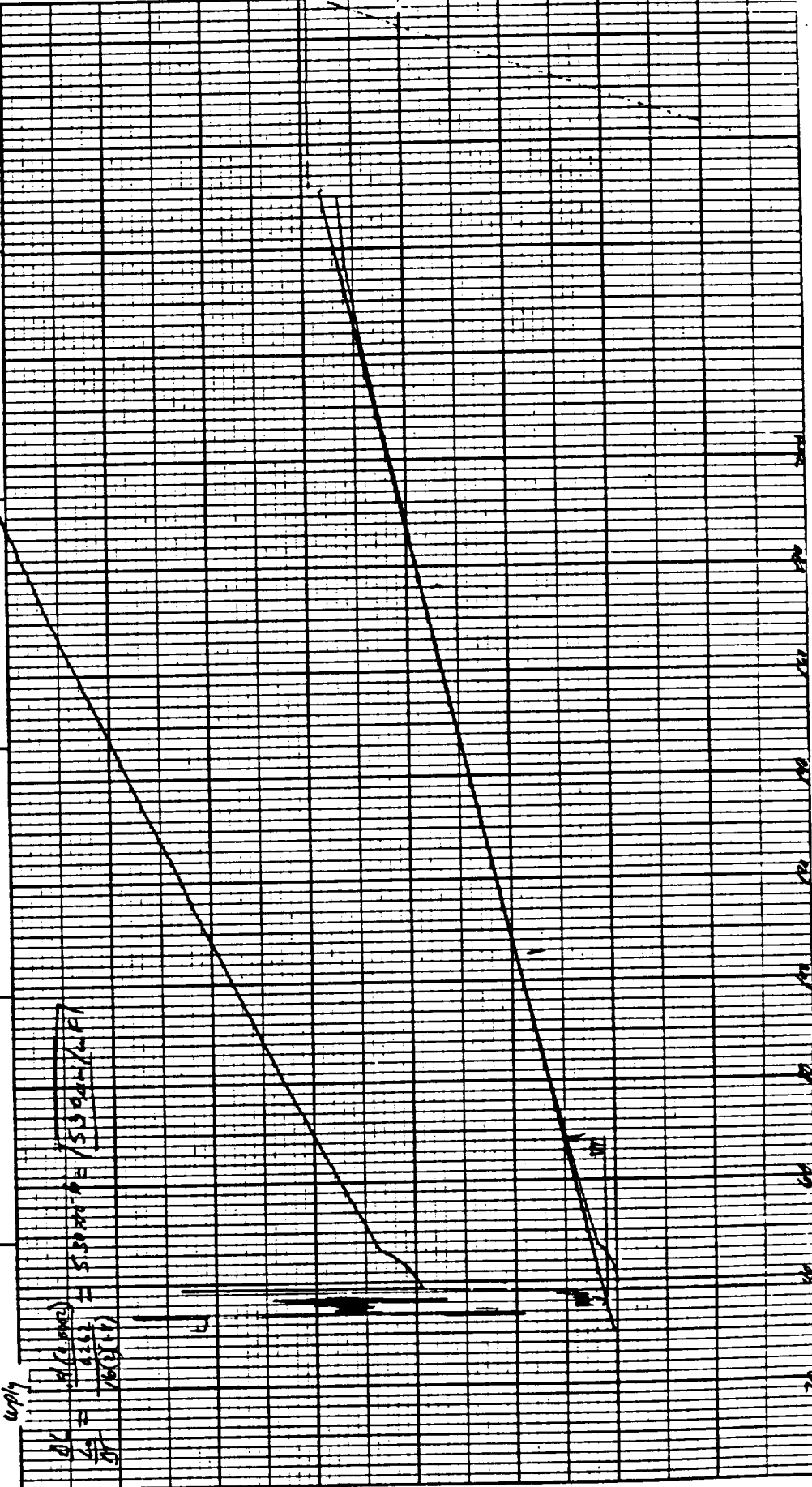
(6.1)

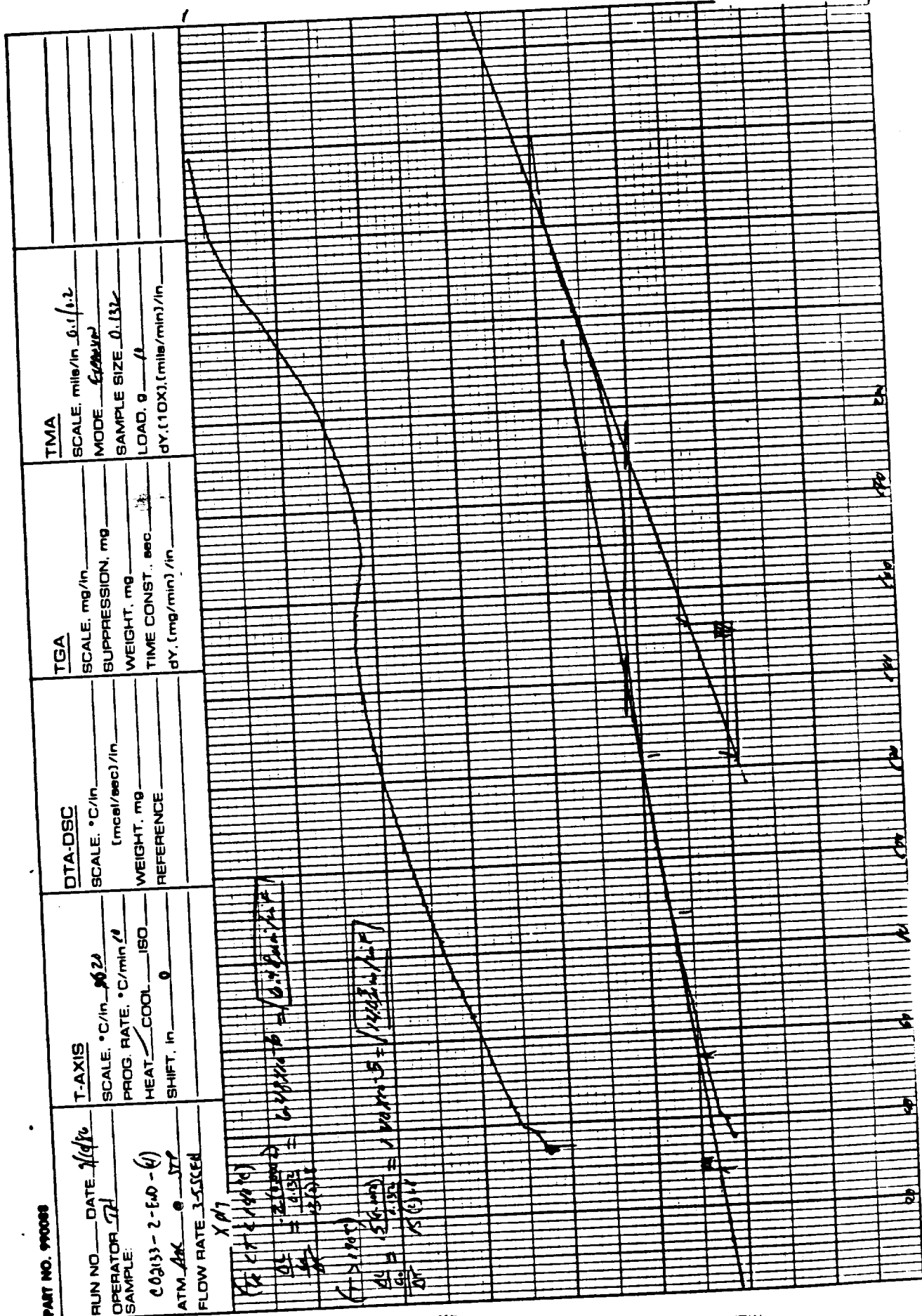
(2.2)

0.7

PART NO. 990088

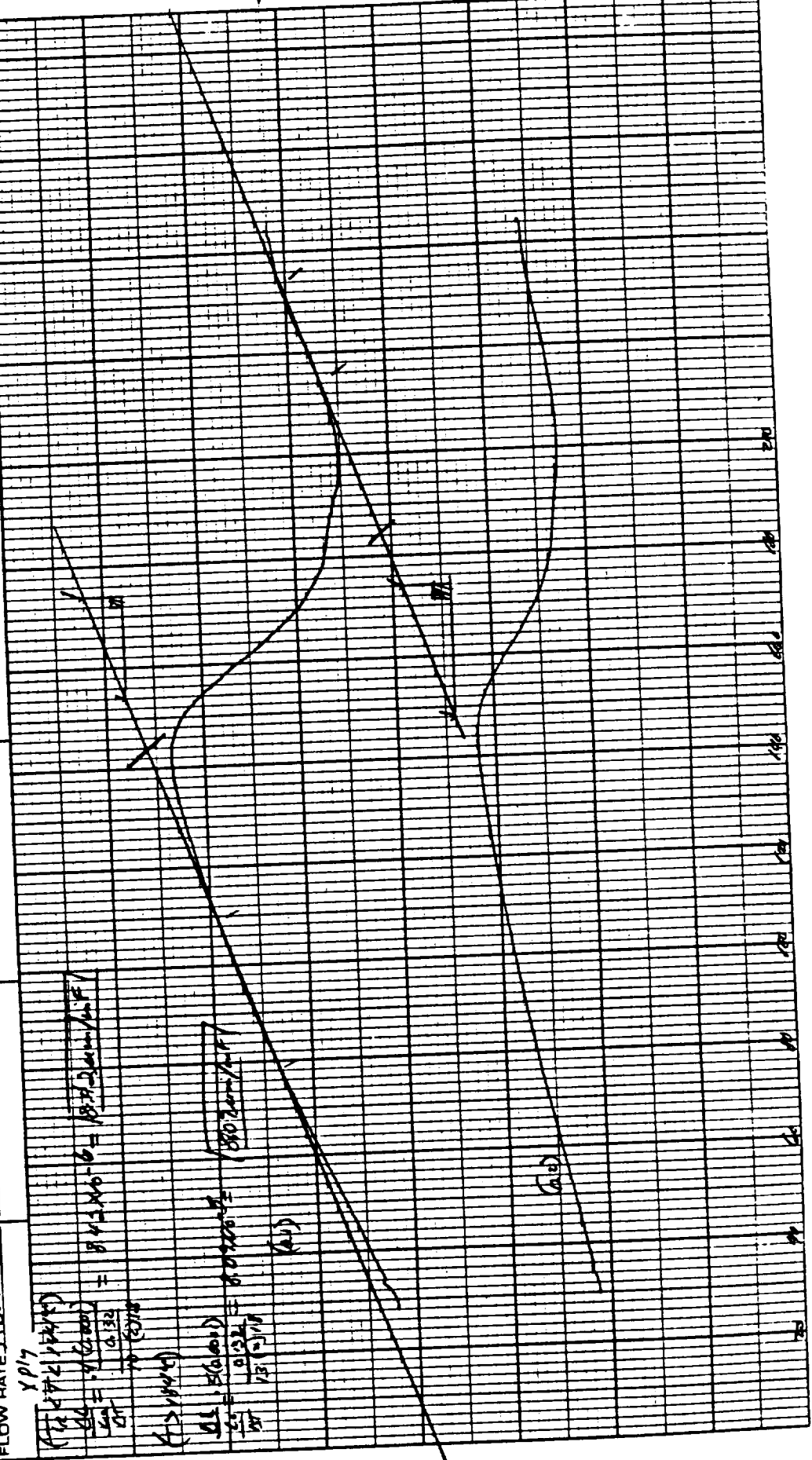
RUN NO. <u>9</u> / <u>11</u> OPERATOR <u>RT</u> SAMPLE: <u>0.133-2-200-2</u> ATM <u>20</u> @ <u>50</u> FLOW RATE <u>1.5</u> cc/min	T-AXIS SCALE: °C/in <u>20</u> PROG. RATE: °C/min <u>1</u> HEAT <input checked="" type="checkbox"/> COOL <input type="checkbox"/> ISO <input type="checkbox"/> SHIFT: in <u>0</u>	DTA-DSC SCALE: °C/in <u>20</u> (mcal/sec)/in WEIGHT: mg REFERENCE	TGA SCALE: mg/in SUPPRESSION: mg WEIGHT: mg TIME CONST.: sec <u>24</u> dY: (mg/min)/in	TMA SCALE: mils/in <u>0.1</u> MODE <u>6</u> (pen/40) SAMPLE SIZE <u>0.262</u> LOAD: g <u>10</u> dY: (mils/min)/in
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PART NO. 990088

RUN NO. <u>DATE 9/10/86</u> OPERATOR <u>DL</u> SAMPLE <u>CO 2133-2-FWD-6</u> ATM. <u>DL</u> @ <u>37</u> FLOW RATE <u>35.5 LSCA</u>		T-AXIS SCALE, °C/in. <u>20</u> PROG. RATE, °C/min <u>10</u> HEAT <u>COOL</u> ISO <u>0</u> SHIFT, in. <u>0</u>		DTA-DSC SCALE, °C/in. <u>(mcal/sec)/in.</u> WEIGHT, mg <u>REFERENCE</u>		TGA SCALE, mg/in. <u>0.1/0.1</u> SUPPRESSION, mg <u>0.132</u> WEIGHT, mg <u>10</u> TIME CONST., sec <u>10</u> dY, (10X), (mils/min)/in. <u>10</u>	
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PART NO. 990083

PART NO. 990088 RUN NO. 51116 OPERATOR SAMPLE: 02133-3-3 start - (1) ATM. 100 @ 300 FLOW RATE 3.55 L/H		T-AXIS SCALE. °C/in. 20 PROG. RATE. °C/min. 10 HEAT. COOL. ISO SHIFT. in. 0		DTA-DSC SCALE. °C/in. (mcal/sec)/in. WEIGHT. mg REFERENCE		TGA SCALE. mg/in. SUPPRESSION. mg WEIGHT. mg TIME CONST. sec. dY. (mg/min) /in.		TMA SCALE. mils/in. 0.1/0.2 MODE. 600mV SAMPLE SIZE. 0.25g LOAD. 9 dY. (mils/min) /in.	
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$\frac{dW}{dt} = \frac{3.8 \text{ (mg)}}{0.25 \text{ (g)}} = 3.04 \text{ (mg/g)} = 3.04 \text{ (mils/g)} \cdot F$
 $\frac{dW}{dt} = 17.60 \text{ (mils/g)} \cdot F$

PART NO. 990088

RUN NO. DATE 9/11/86

OPERATOR

SAMPLE 012133-3-SMART-(6)ATM 40 @ SPFLOW RATE 3.504WPLY

T-AXIS

SCALE, °C/in. 50.24PROG. RATE, °C/min. 1HEAT ✓ COOL ISOSHIFT, in. 0

DTA-DSC

SCALE, °C/in.

(mcal/sec)/in.

WEIGHT, mg

REFERENCE

TGA

SCALE, mg/in.

SUPPRESSION, mg

WEIGHT, mg

TIME CONST., sec

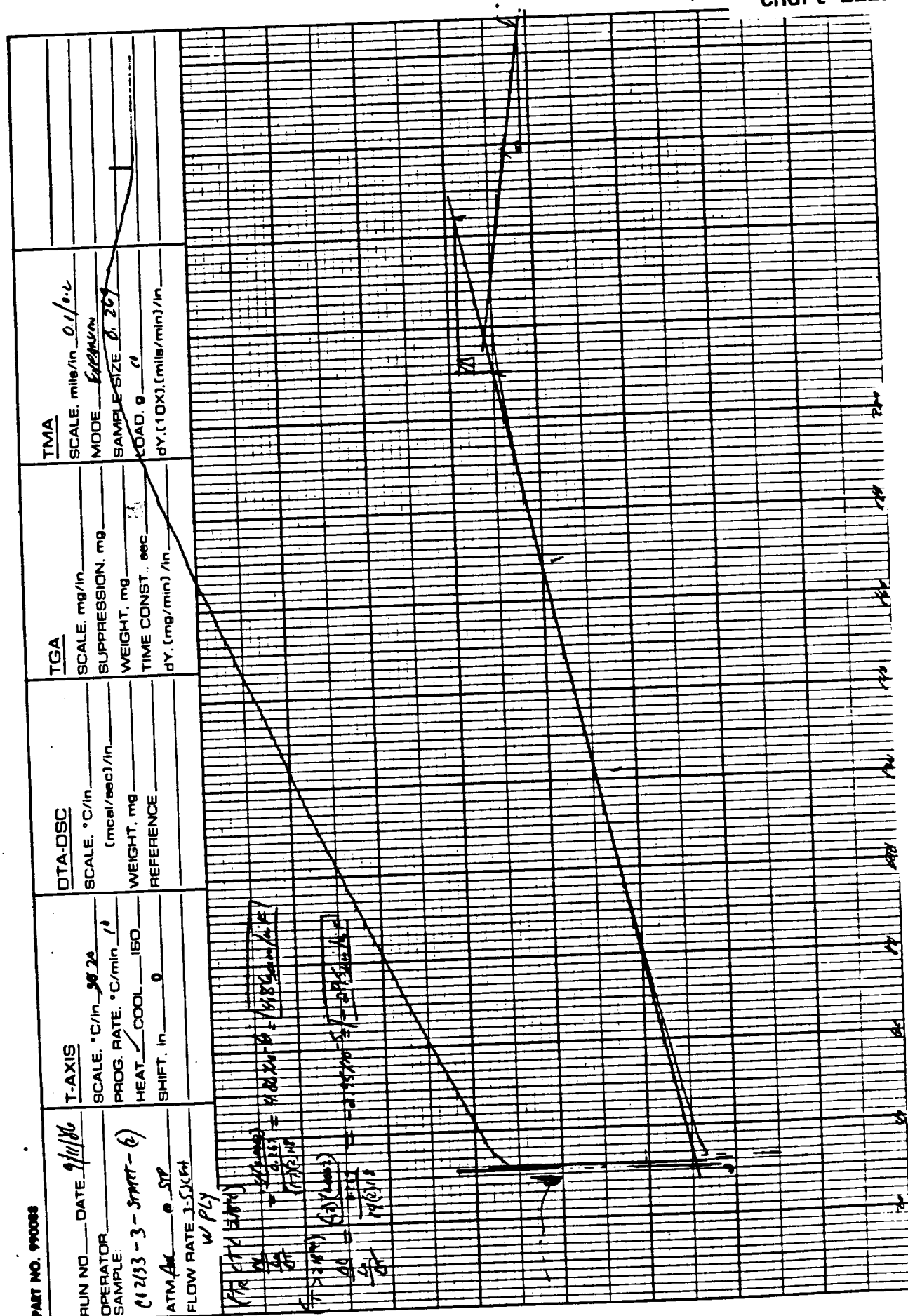
dY, (mg/min)/in.

TMA

SCALE, mils/in. 0.1/0.2MODE EXPANSAMPLE SIZE 0.207LOAD, g 0

dY, (10X) (mils/min)/in.

$$\begin{aligned}
 \frac{dW}{dt} &= \frac{24.2 \text{ mg}}{17.2 \text{ min}} = 1.407 \text{ mg/min} \\
 \frac{dW}{dt} &= \frac{24.2 \text{ mg}}{17.2 \text{ min}} = 1.407 \text{ mg/min} \\
 \frac{dW}{dt} &= \frac{24.2 \text{ mg}}{17.2 \text{ min}} = 1.407 \text{ mg/min} \\
 \frac{dW}{dt} &= \frac{24.2 \text{ mg}}{17.2 \text{ min}} = 1.407 \text{ mg/min}
 \end{aligned}$$



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PART NO. 990088

RUN NO. 914120
 OPERATOR TH
 SAMPLE: CO 2133-3-3745-41
 ATM. PM @ 30
 FLOW RATE 2.5164

T-AXIS
 SCALE, °C/in. 50 20
 PROG. RATE, °C/min 0
 HEAT COOL ISO
 SHIFT, in. 0

DTA-DSC
 SCALE, °C/in. (mcal/sec)/in.
 WEIGHT, mg
 REFERENCE

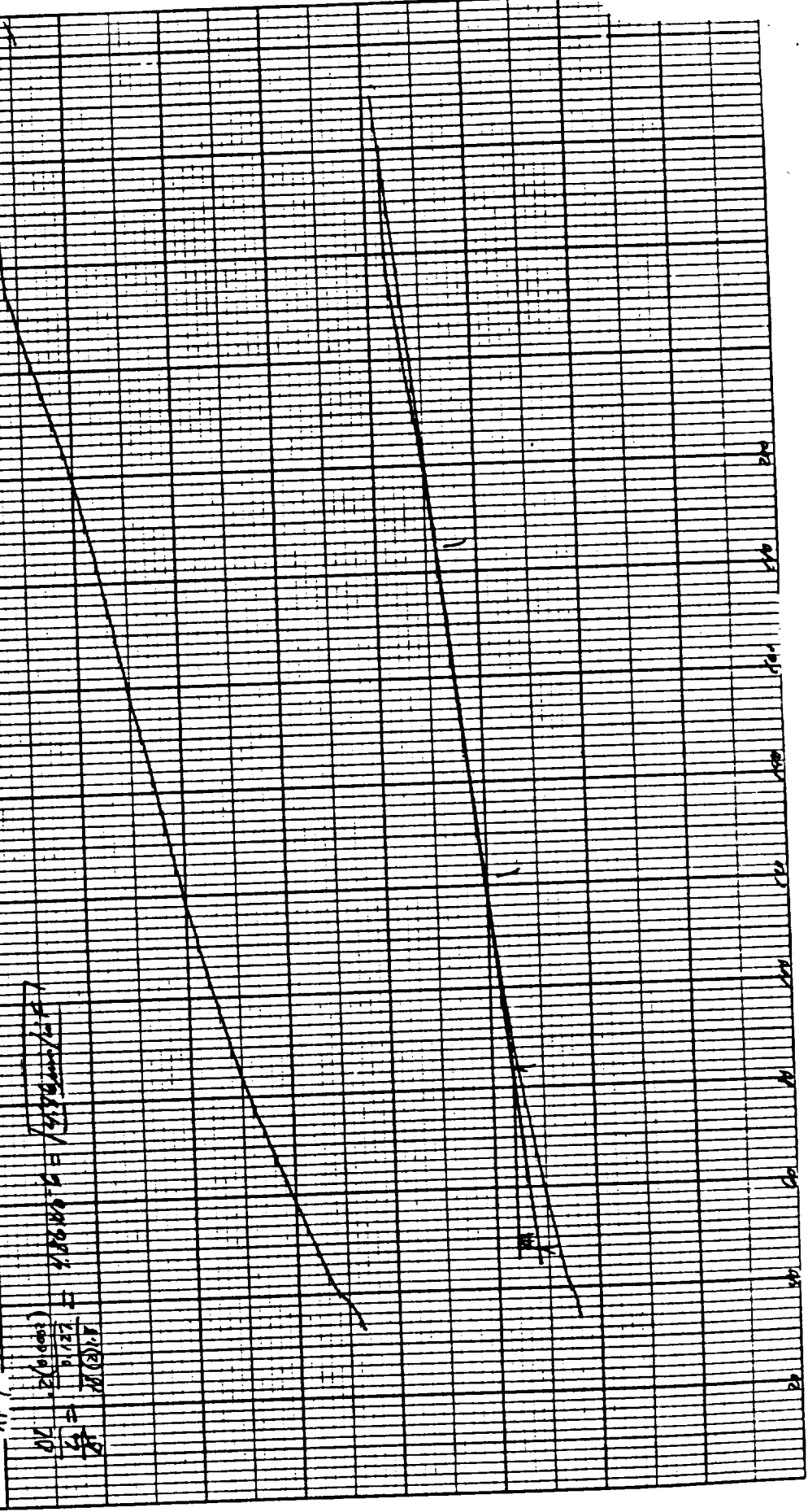
TGA
 SCALE, mg/in.
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec.
 dY, (mg/min)/in.

TMA
 SCALE, mils/in. 0.1/100
 MODE EXPANSION
 SAMPLE SIZE 0.127
 LOAD, g 10
 dY, (10X), (mils/min)/in.

XPLV

$$\frac{0.1}{2.5164} = \frac{0.1}{2.5164} = 0.0397$$

$$\frac{0.1}{2.5164} = \frac{0.1}{2.5164} = 0.0397$$



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Chart Z1E5

PART NO. 990088

RUN NO. DATE 1/10/76
OPERATOR JH
SAMPLE: CO₂ 33-3-30000-5
ATM. Pres. @ JH
FLOW RATE 3-5564

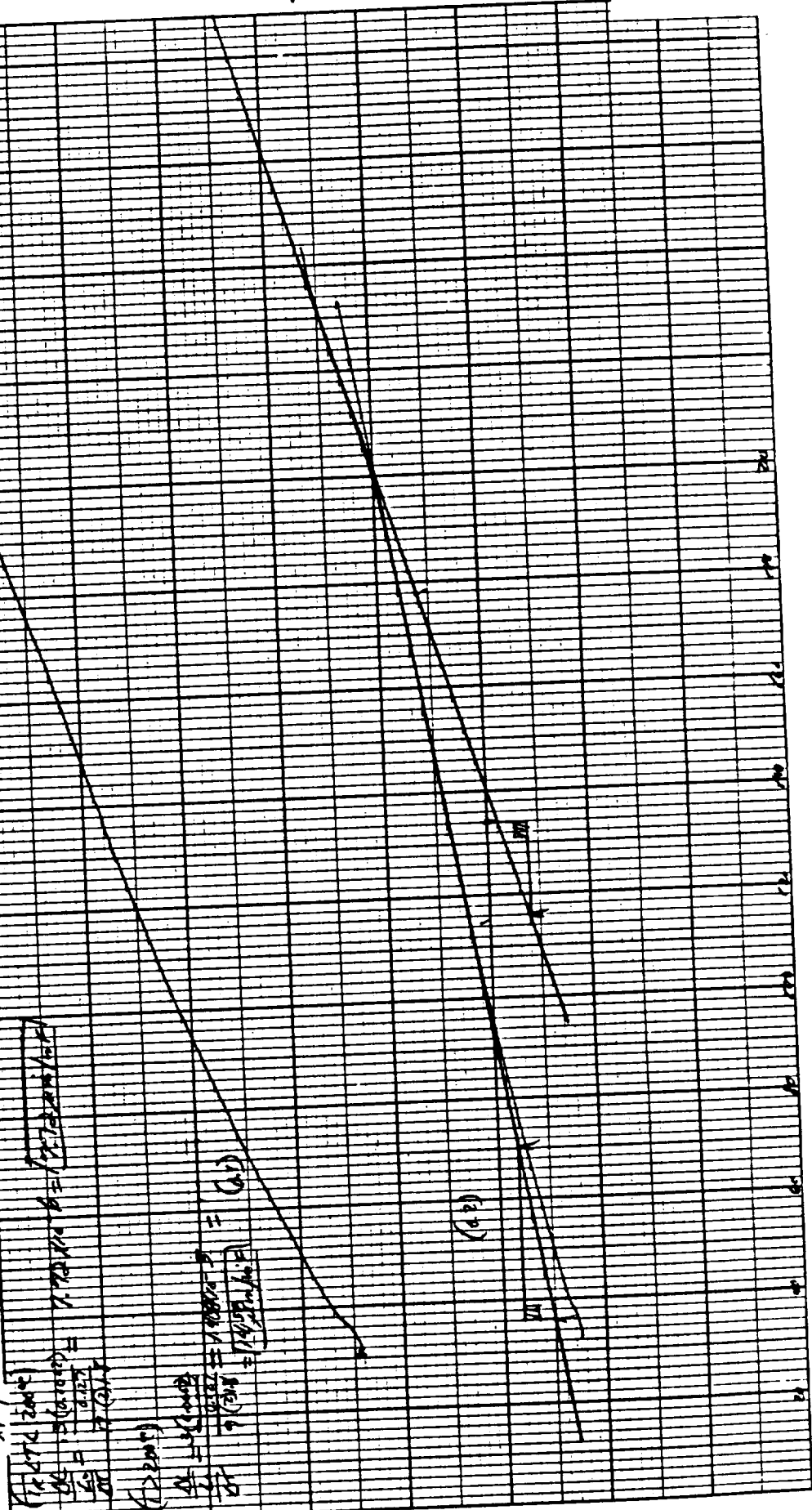
T-AXIS
SCALE, °C/in. 9620
PROG. RATE, °C/min 10
HEAT COOL ISO
SHIFT, in 0

DTA-DSC
SCALE, °C/in.
(mcal/sec)/in.
WEIGHT, mg
REFERENCE

TGA
SCALE, mg/in.
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec.
dY, (mg/min)/in.

TMA
SCALE, mils/in. 0.1/0.2
MODE EXAMIN
SAMPLE SIZE 0.129
LOAD, g 10
dY, (10X) mils/min/in.

XP19
 $\frac{1.72 \times 10^6}{1.72 \times 10^6} = 1.72 \times 10^6$
 $\frac{1.72 \times 10^6}{1.72 \times 10^6} = 1.72 \times 10^6$
 $\frac{1.72 \times 10^6}{1.72 \times 10^6} = 1.72 \times 10^6$
 $\frac{1.72 \times 10^6}{1.72 \times 10^6} = 1.72 \times 10^6$



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PART NO. 990088

RUN NO. 91166
 DATE 9/1/66
 OPERATOR TH
 SAMPLE C-2133-3-B-00-(1)
 ATM 24 @ 20
 FLOW RATE 3.55 GPH

T-AXIS
 SCALE, °C/in. 30/10
 PROG. RATE, °C/min. 0
 HEAT COOL 180
 SHIFT, in. 0

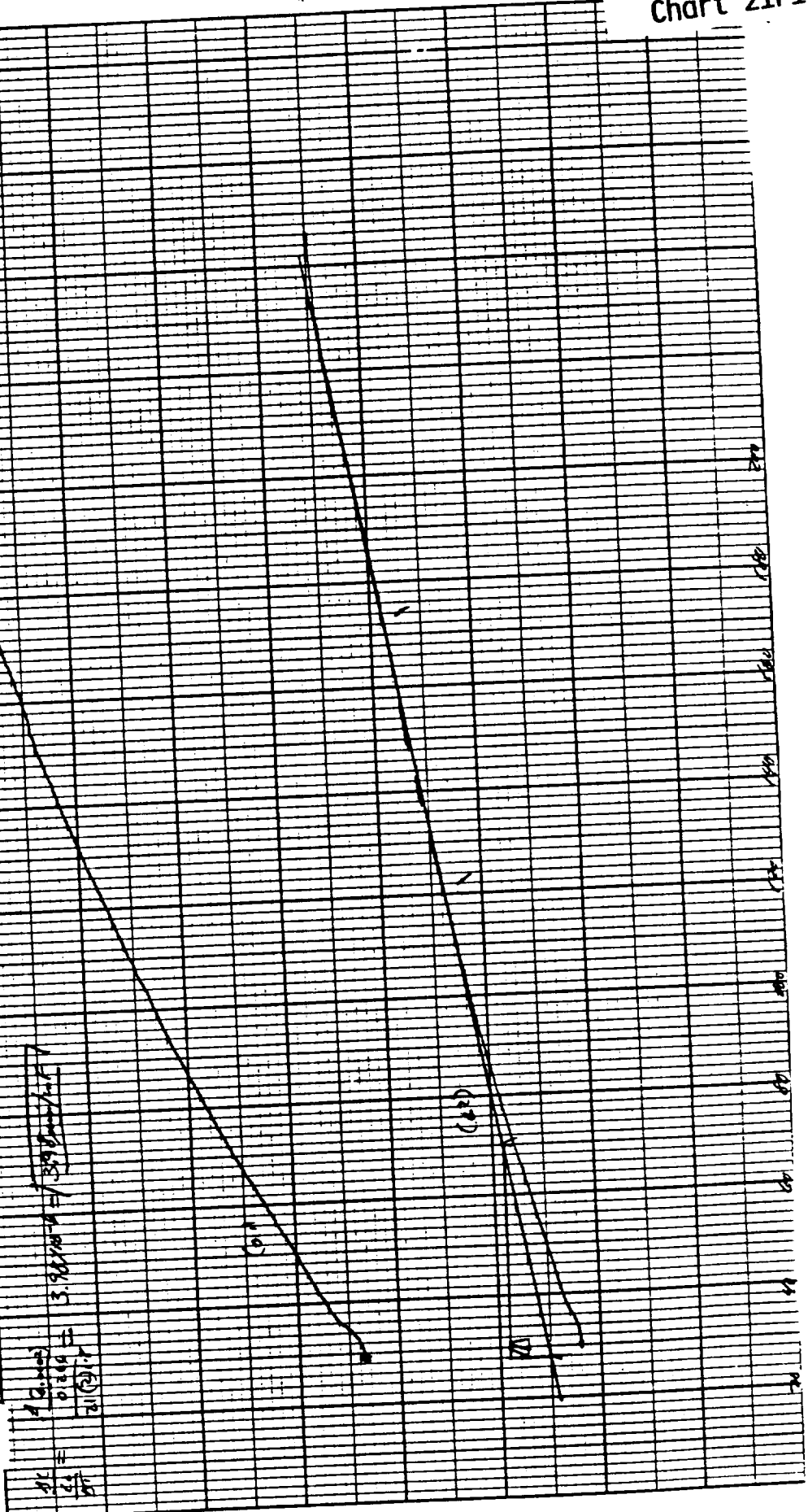
DTA-DSC
 SCALE, °C/in. (mcal/sec)/in
 WEIGHT, mg REFERENCE

TGA
 SCALE, mg/in. ---
 SUPPRESSION, mg ---
 WEIGHT, mg ---
 TIME CONST., sec. ---
 dY, (mg/min)/in. ---

TMA
 SCALE, mils/in. 0.1/0.2
 MODE EXAMINATION
 SAMPLE SIZE 0.264
 LOAD, g. ---
 dY, (mils/min)/in. ---

$$\frac{dY}{dt} = \frac{0.264}{3.55} = 0.0744$$

$$3.98 \times 10^{-4} = 3.98 \times 10^{-4} \times 10^{-4}$$



PART NO. 990088

RUN NO. 9/11/16
 OPERATOR JK
 SAMPLE: 00133-3-End-6
 ATM. Atm 0 DP
 FLOW RATE 3.55 cc/min

T-AXIS
 SCALE, °C/in 30/20
 PROG. RATE, °C/min 10
 HEAT COOL ISO
 SHIFT, in 0

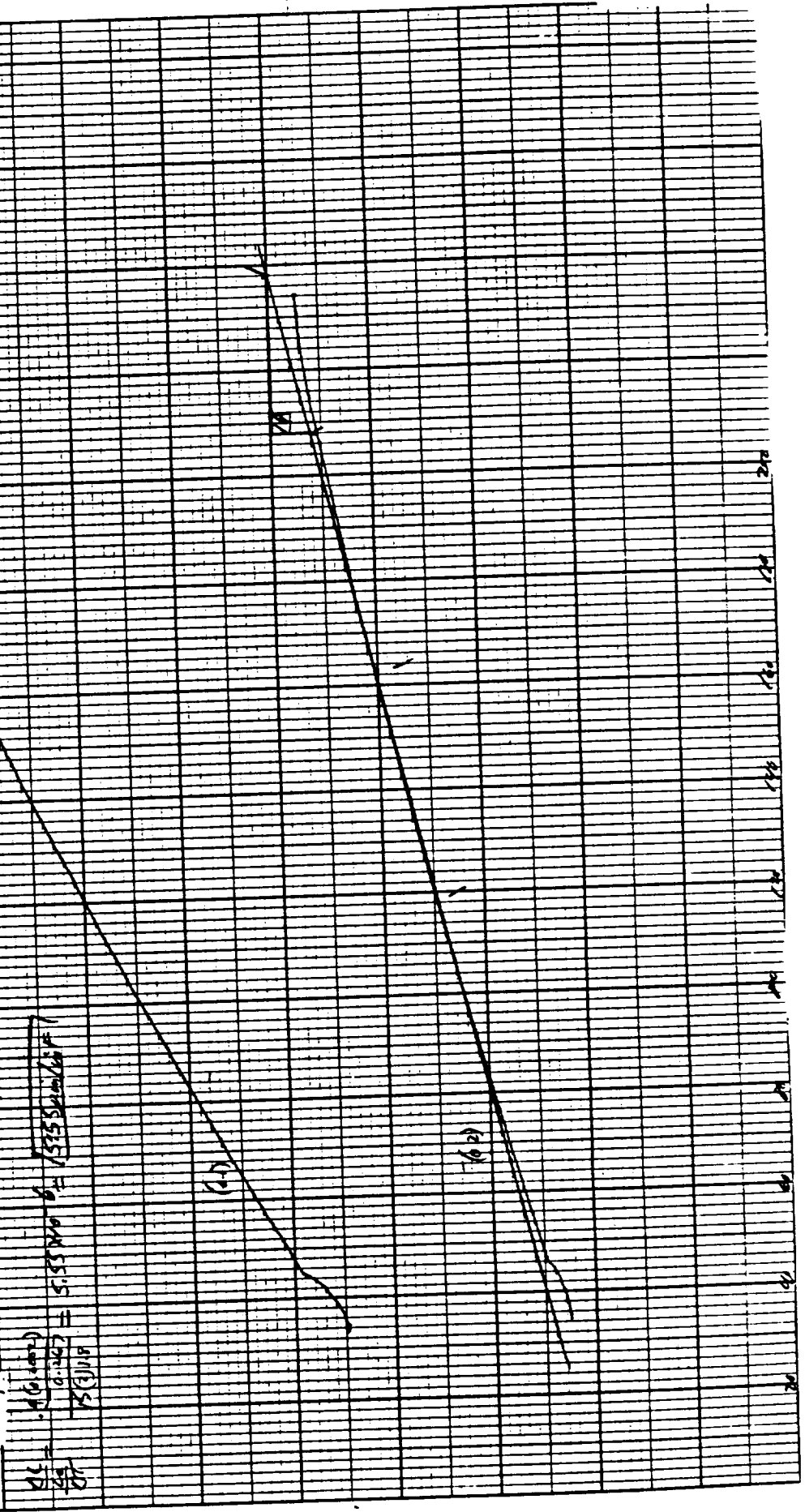
DTA-DSC
 SCALE, °C/in
 (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

TGA
 SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dY, (mg/min)/in

TMA
 SCALE, mils/in 0.01/0.2
 MODE Extension
 SAMPLE SIZE 0.267
 LOAD, g 10
 dY, (10X) (mils/min)/in

WPIY

$$\frac{dY}{dX} = \frac{0.01(0.002)}{0.267} = 5.53 \times 10^{-6} = 5.53 \times 10^{-6} \text{ (mils/min)/in}$$



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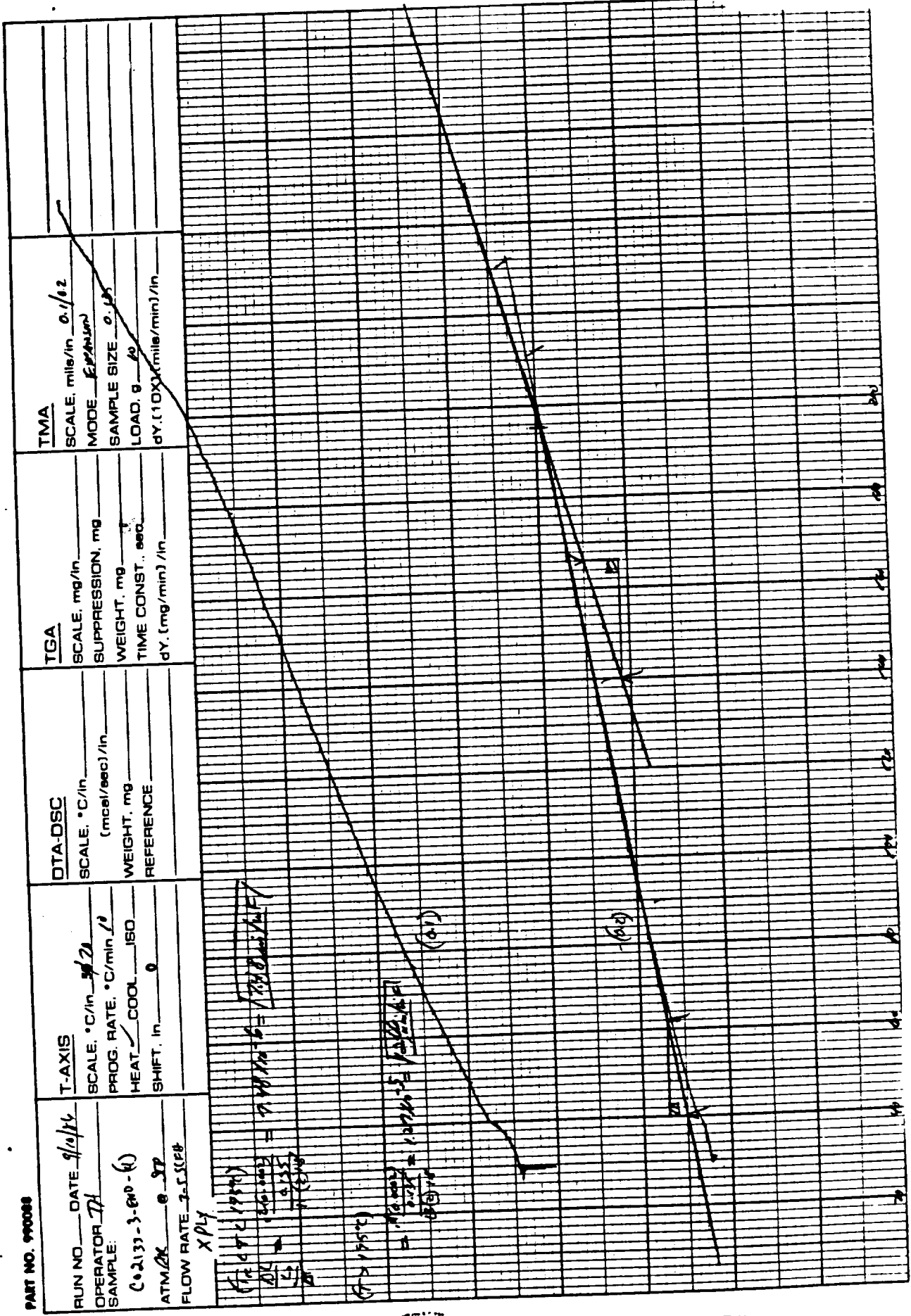
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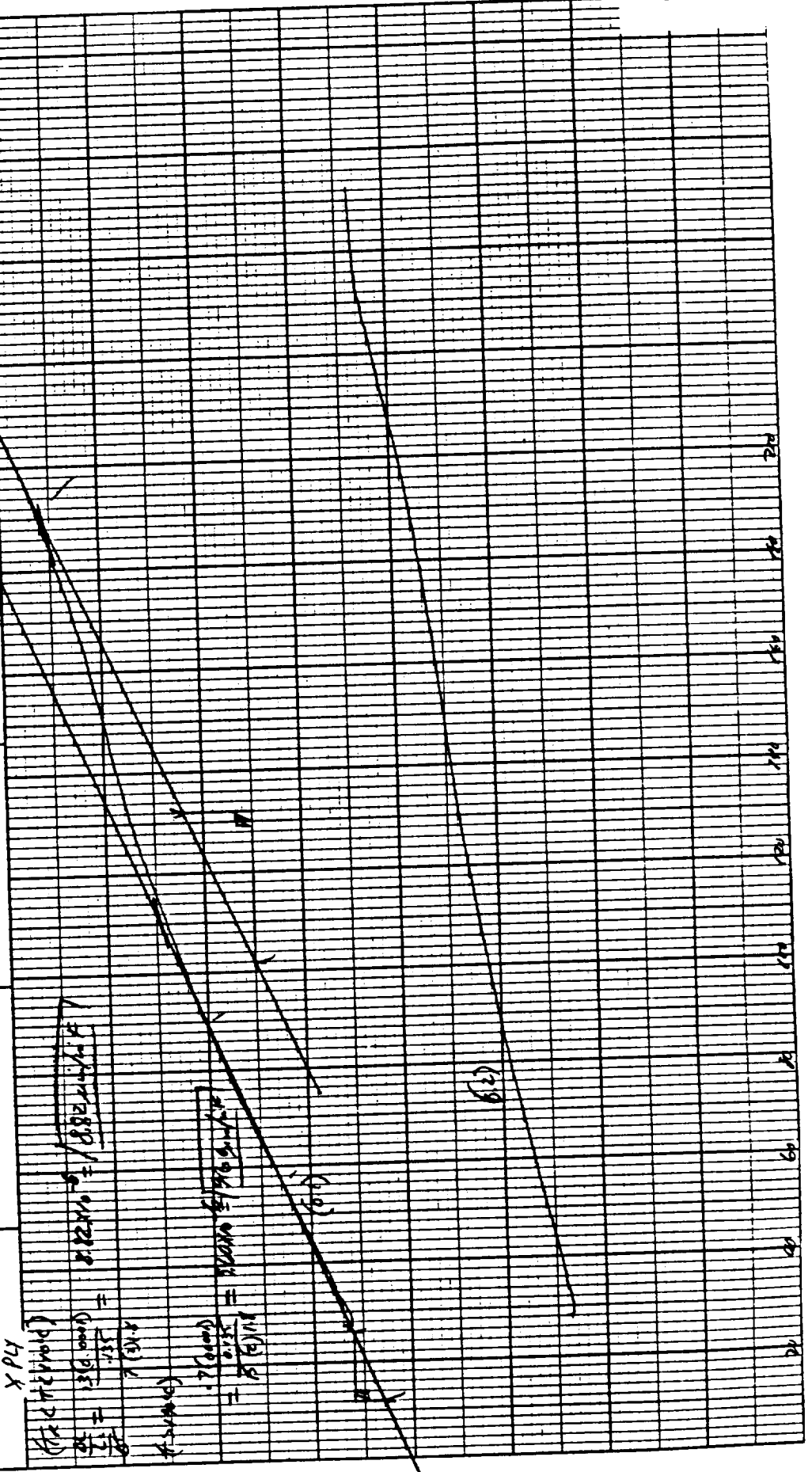
RUN NO. DATE 7/10/76
 OPERATOR JH
 SAMPLE: 002133-3-640-5
 ATM. Pres. @ 572
 FLOW RATE 3.55 (cf)

T-AXIS
 SCALE: °C/in 90.2
 PROG. RATE: °C/min 1.0
 HEAT: COOL ISO
 SHIFT: in 0

DTA-DSC
 SCALE: °C/in
 (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

TGA
 SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dV, (mg/min)/in

TMA
 SCALE, mils/in 0.1/0.2
 MODE 2000-sec
 SAMPLE SIZE 135
 LOAD, g 10
 dV, (10X), (mils/min)/in



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PART NO. 990088

RUN NO. DATE 9/11/86
 OPERATOR TA
 SAMPLE: 62133-4-SMART-(1)
 ATM. Ar 0.50
 FLOW RATE 3.5X44

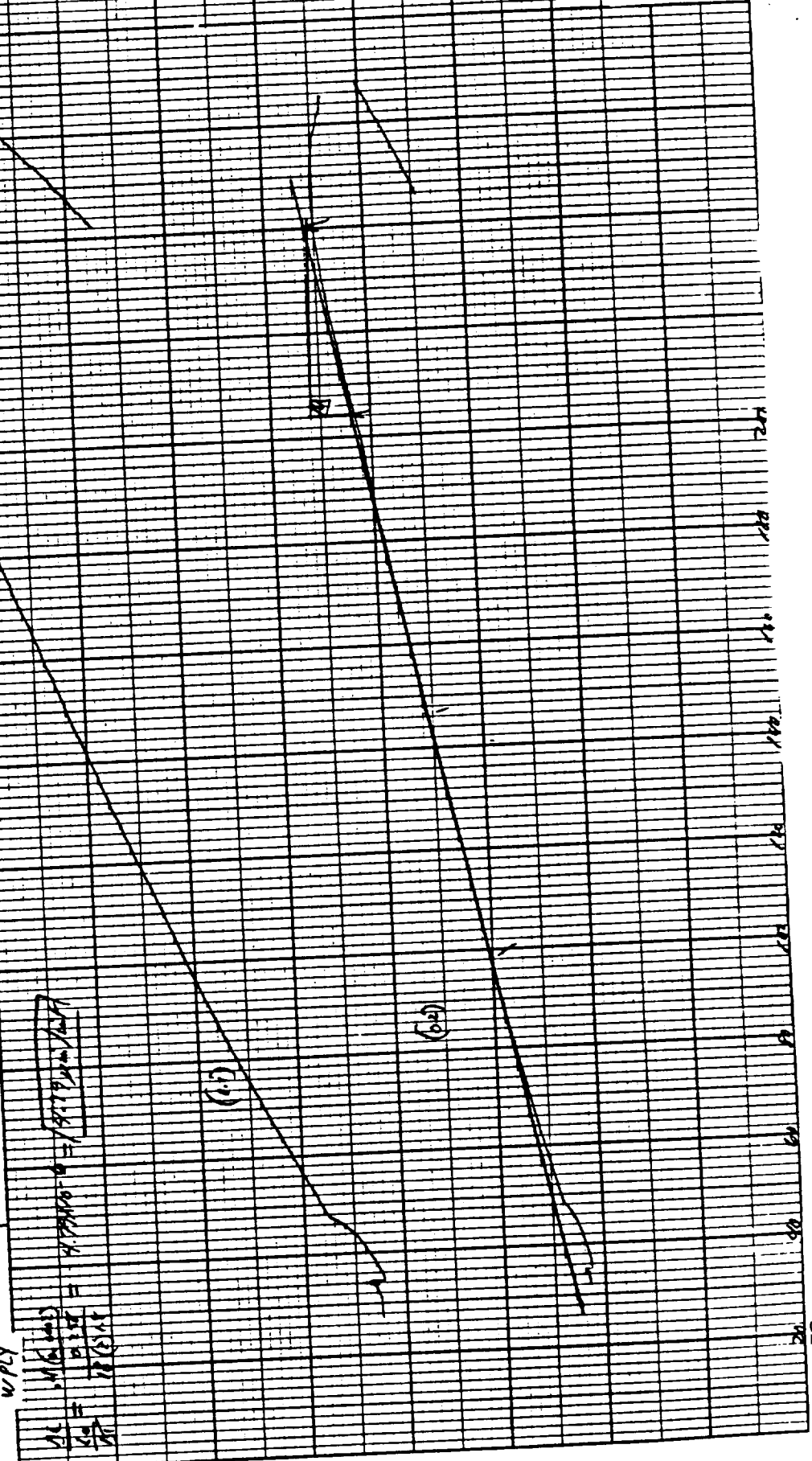
T-AXIS
 SCALE: °C/in 50/24
 PROG. RATE: °C/min 10
 HEAT ✓ COOL ISO
 SHIFT: in 0

DTA-DSC
 SCALE: °C/in
 (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

TGA
 SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dY, (mg/min)/in

TMA
 SCALE, mils/in 0.1/0.2
 MODE EXPANSION
 SAMPLE SIZE 0.258
 LOAD, g 1
 dY, (10X), (mils/min)/in

WPLY
 $\frac{dL}{dY} = \frac{1.16 \times 10^{-3}}{1.76 \times 10^{-4}} = 6.6$
 $\frac{dL}{dY} = \frac{1.16 \times 10^{-3}}{1.76 \times 10^{-4}} = 6.6$



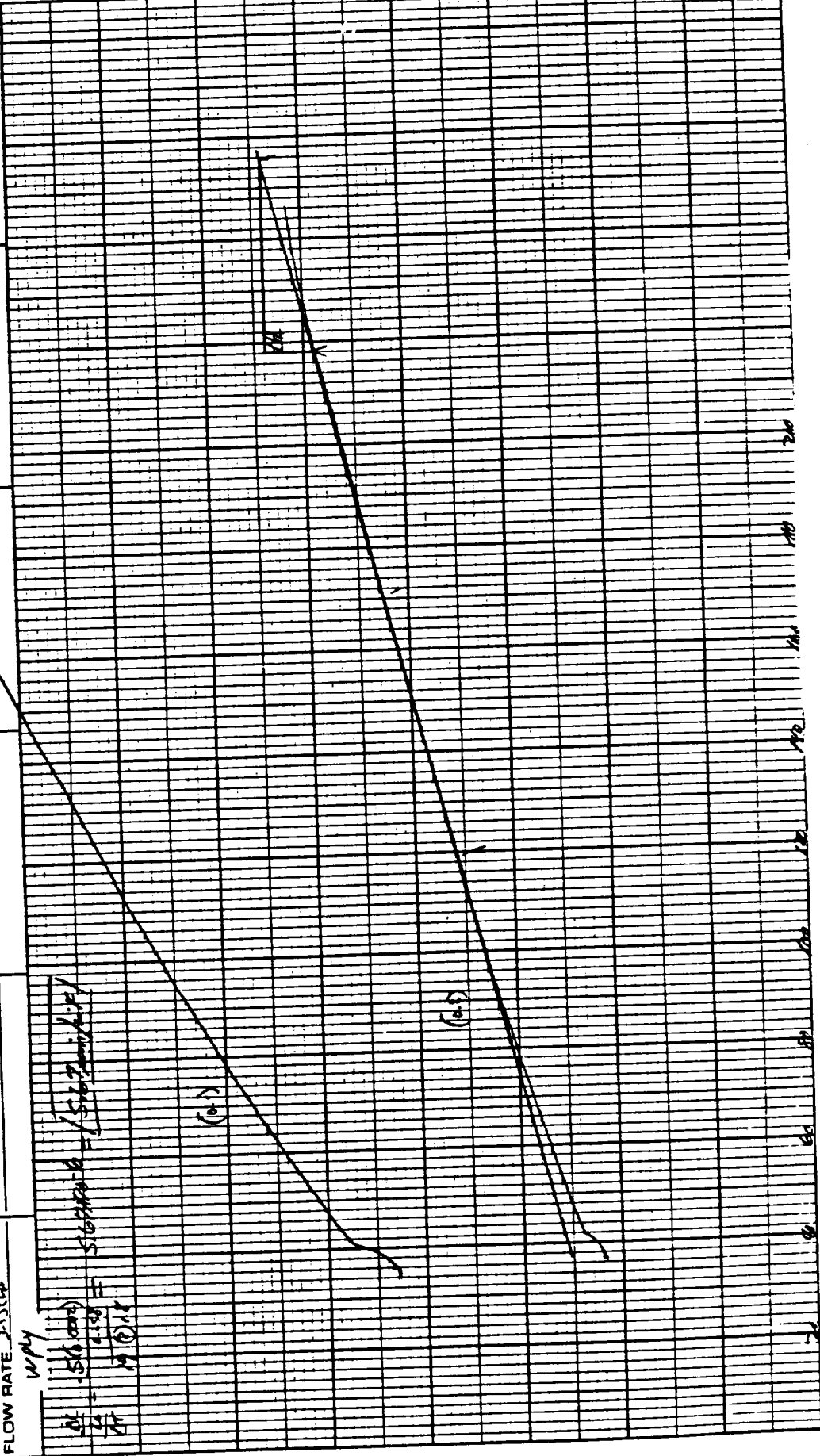
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MEASURED VARIABLE

PART NO. 990088

RUN NO. <u>9/11/66</u> OPERATOR <u>PT</u> SAMPLE <u>C03133-9-3700T-(2)</u> ATM. <u>SEA</u> @ <u>SEA</u> FLOW RATE <u>2.55 L/min</u>		T-AXIS SCALE, °C/in <u>30/20</u> PROG. RATE, °C/min <u>0</u> HEAT <u>COOL</u> <u>180</u> SHIFT, in <u>0</u>		DTA-DSC SCALE, °C/in <u>(mcal/sec)/in</u> WEIGHT, mg <u>REFERENCE</u>		TGA SCALE, mg/in <u>100</u> SUPPRESSION, mg <u>0</u> WEIGHT, mg <u>0</u> TIME CONST, sec <u>0</u> dY, (mg/min)/in <u>0</u>		TMA SCALE, mils/in <u>0.1/0.2</u> MODE <u>EXPAN</u> SAMPLE SIZE <u>0.25X</u> LOAD, g <u>0</u> dY, (10X), (mils/min)/in <u>0</u>	
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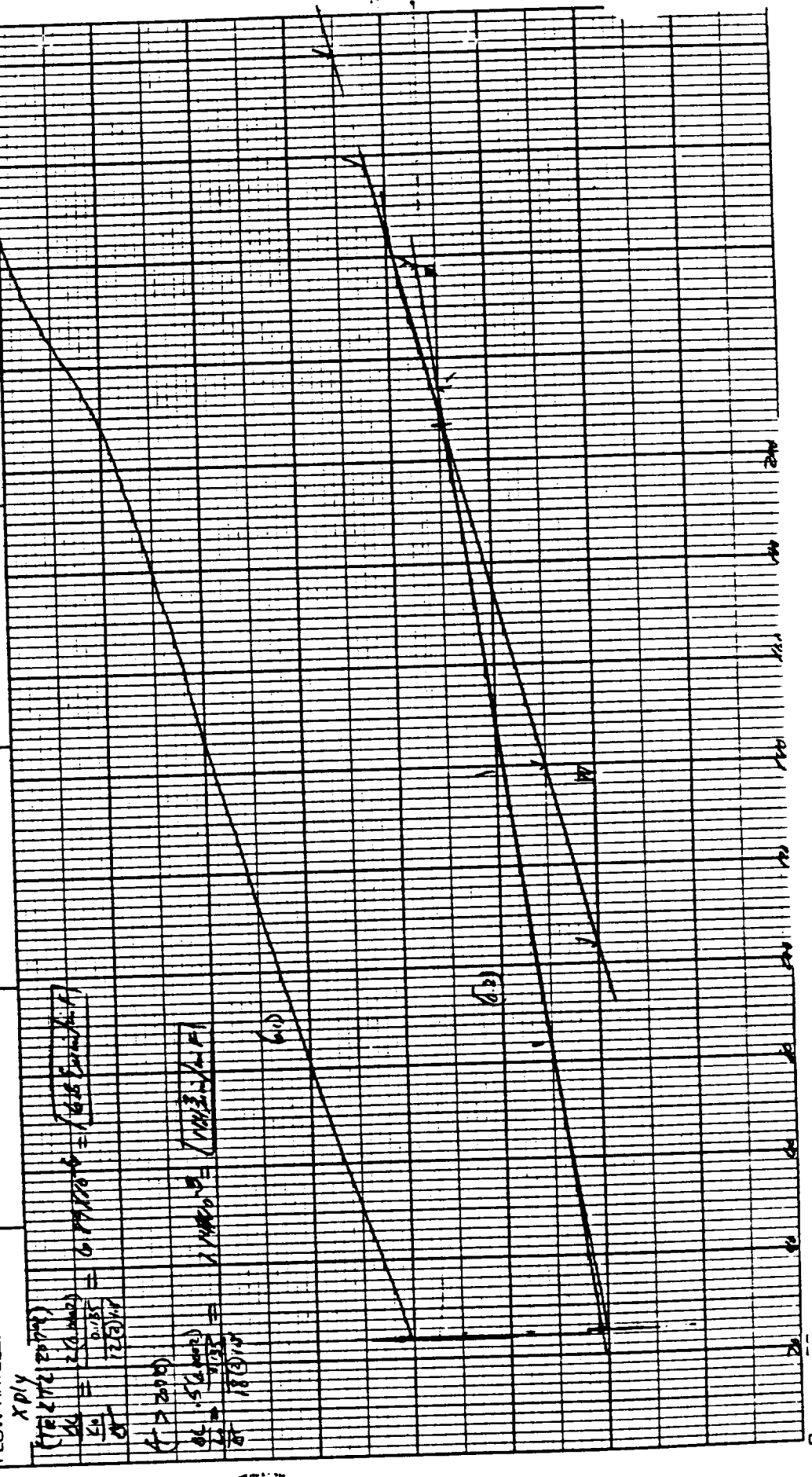
DU PONT

INSTRUMENTS

MEASURED VARIABLE

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OF POOR QUALITY

PART NO. 990088 RUN NO. <u>9/11/6</u> OPERATOR <u>TH</u> SAMPLE <u>Co 2133 - 4 - smac - (4)</u> ATM. <u>Am</u> @ <u>37</u> FLOW RATE <u>5.5364</u>		T-AXIS SCALE: °C/in <u>30 20</u> PROG. RATE: °C/min <u>10</u> HEAT <u>✓</u> COOL <u>ISO</u> SHIFT, in <u>0</u>		DTA-DSC SCALE: °C/in <u> </u> (mcal/sec)/in <u> </u> WEIGHT, mg <u> </u> REFERENCE <u> </u>		TGA SCALE, mg/in <u> </u> SUPPRESSION, mg <u> </u> WEIGHT, mg <u> </u> TIME CONST., sec <u> </u> dY, (mg/min)/in <u> </u>		TMA SCALE, mils/in <u>0.1/0.2</u> MODE <u>ELANOR</u> SAMPLE SIZE <u>0.135</u> LOAD, g <u>10</u> dY, (10X), (mils/min)/in <u> </u>	
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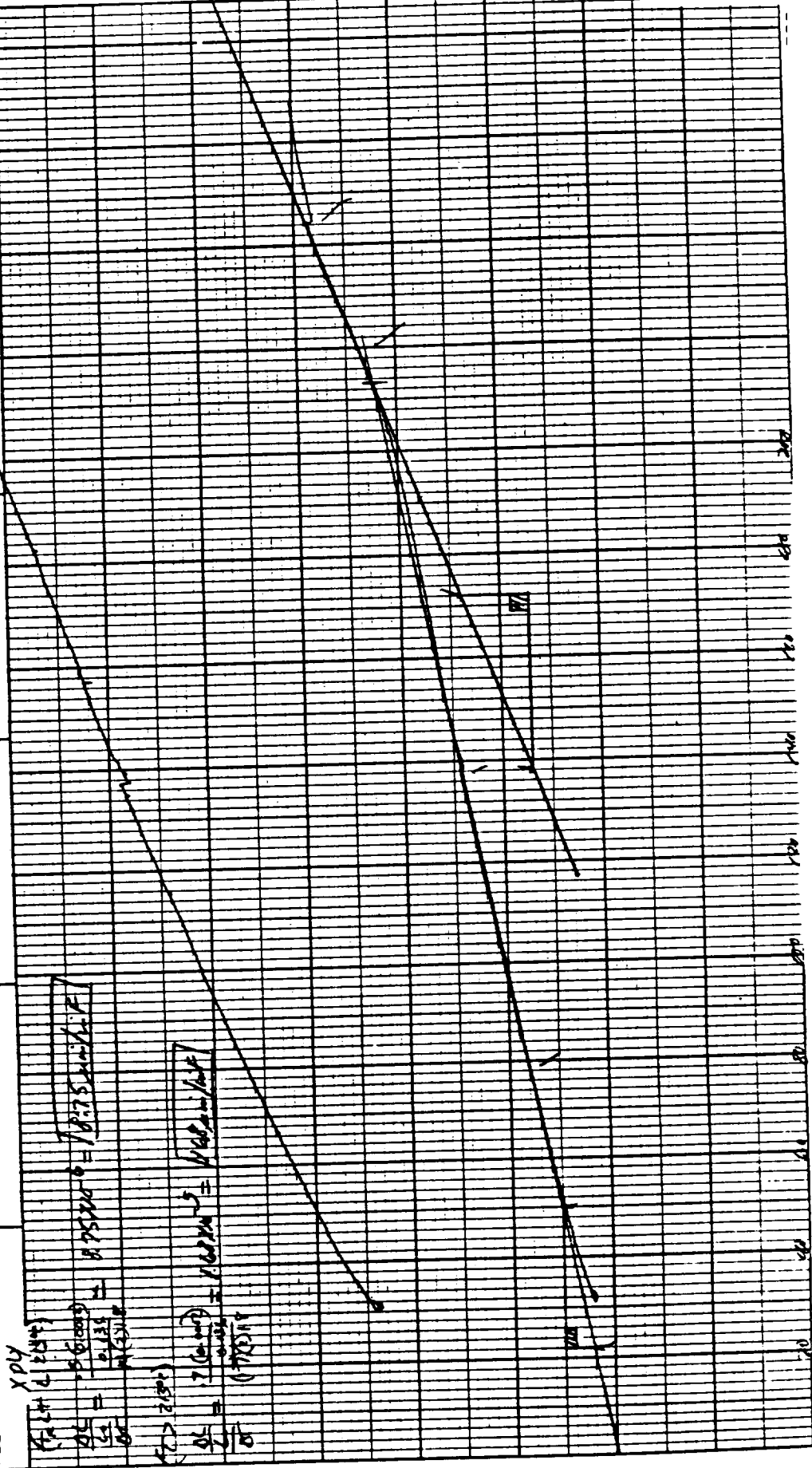


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MEASURED VARIABLE

PART NO. 990088

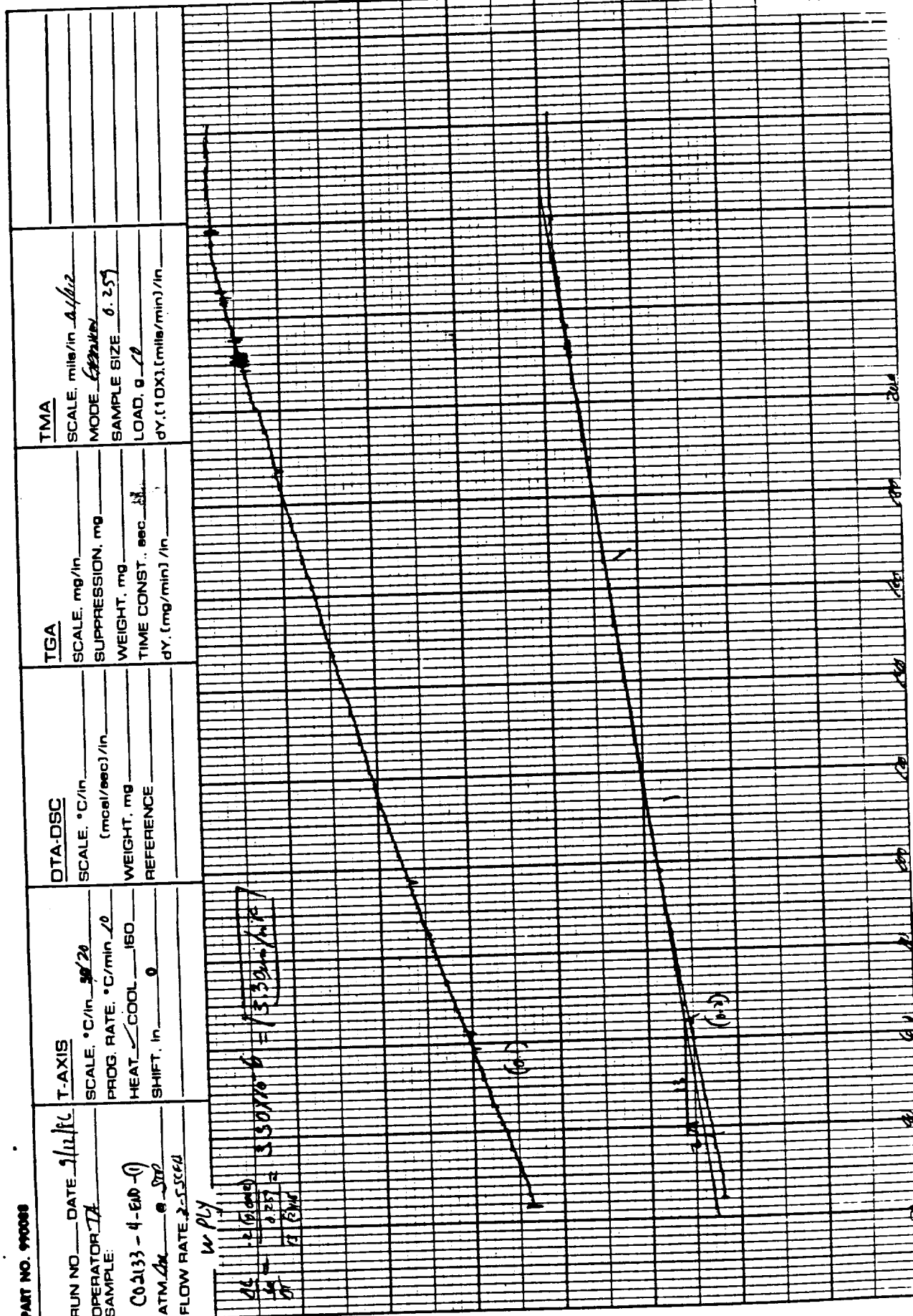
RUN NO. <u>DATE 7/14/86</u> OPERATOR <u>TH</u> SAMPLE: <u>Co2133 - 4-J mat - (5)</u> ATM. <u>PM</u> @ <u>5:07</u> FLOW RATE <u>25.5 L/min</u>		T-AXIS SCALE, °C/in. <u>50/20</u> PROG. RATE, °C/min <u>10</u> HEAT <u>COOL</u> <u>ISO</u> SHIFT, in. <u>0</u>		DTA-DSC SCALE, °C/in. <u>(mcal/sec)/in.</u> WEIGHT, mg <u>REFERENCE</u>		TGA SCALE, mg/in. <u>SUPPRESSION, mg</u> WEIGHT, mg <u>TIME CONST., sec</u> dY, (mg/min)/in. <u>dy, (mg/min)/in.</u>		TMA SCALE, mils/in. <u>0.1/62</u> MODE <u>Calibrate</u> SAMPLE SIZE <u>0.136</u> LOAD, g <u>0</u> dY, (10 ⁻³ mils/min)/in. <u></u>	
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DU PONT Instruments

MEASURED VARIABLE

PART NO. 990088



DUPONT Instruments

MEASURED VARIABLE

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 OF POOR QUALITY

PART NO. 990088

BUN NO DATE 5/12/90

OPERATOR 74

SAMPLE:

Co2133-4-Em- (2)

ATM Ad • Int

FLOW RATE 3.5XFD

T-AXIS

SCALE: 1"=10' 5620

PROG. RATE. °C/min 20

HEAT ☒ COOL ☐ ISO ☐SHIFT, in 0

DTA-DSC

SCALE: °C/in_

(mol/100)

WEIGHT, mg—

REFERENCE

TGA

SCALE, mg/in.

SUPPRESSION, mg...

WEIGHT, mg—

TIME CONST.: 000_

— $\mu\text{g}/(\text{mL}\cdot\text{min})$ 平均

TMA

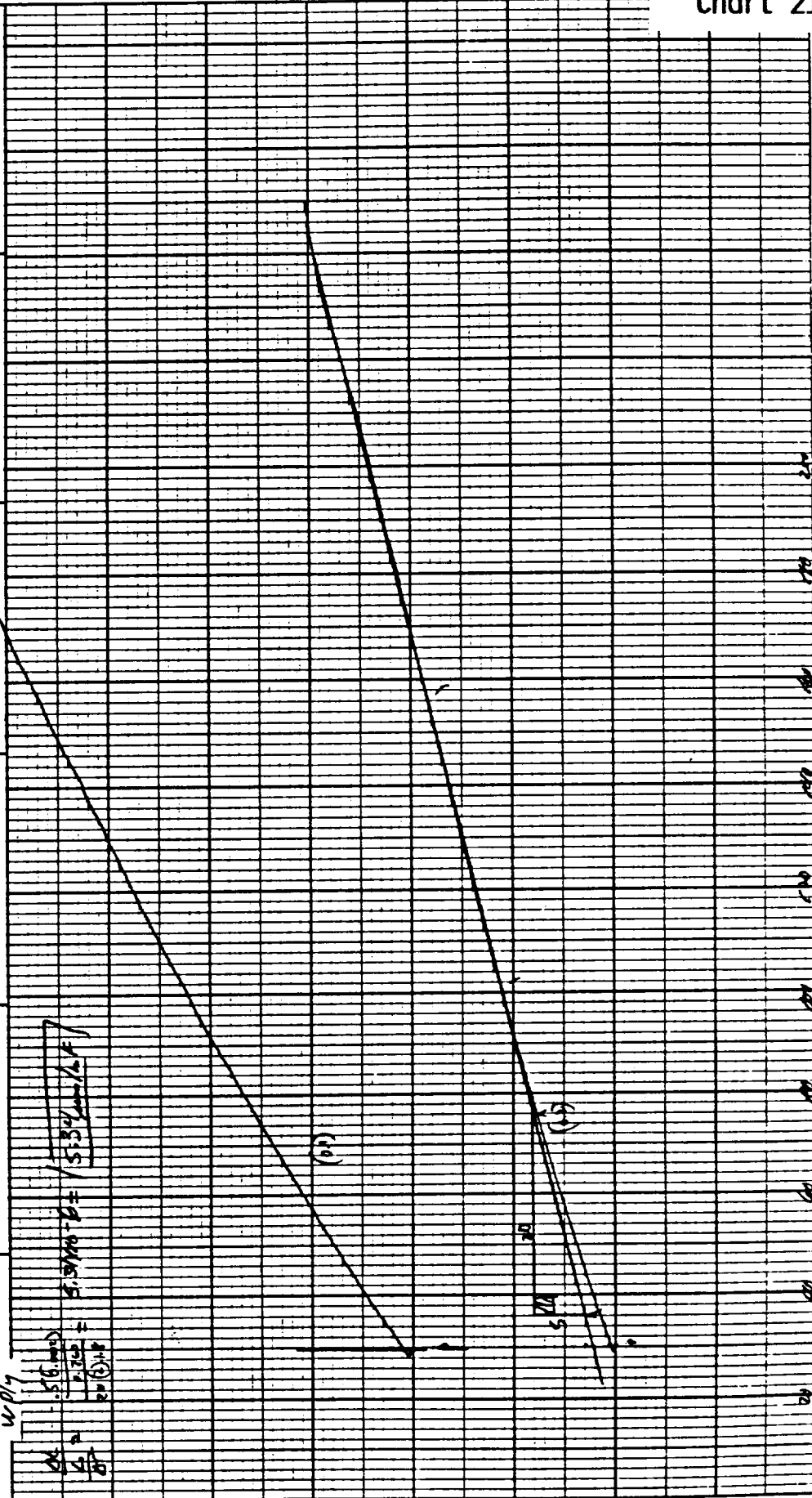
SCALE. miles/in. 0.1/0.2

~~MODE Expansion~~

~~SAMPLE SIZE 0.260~~

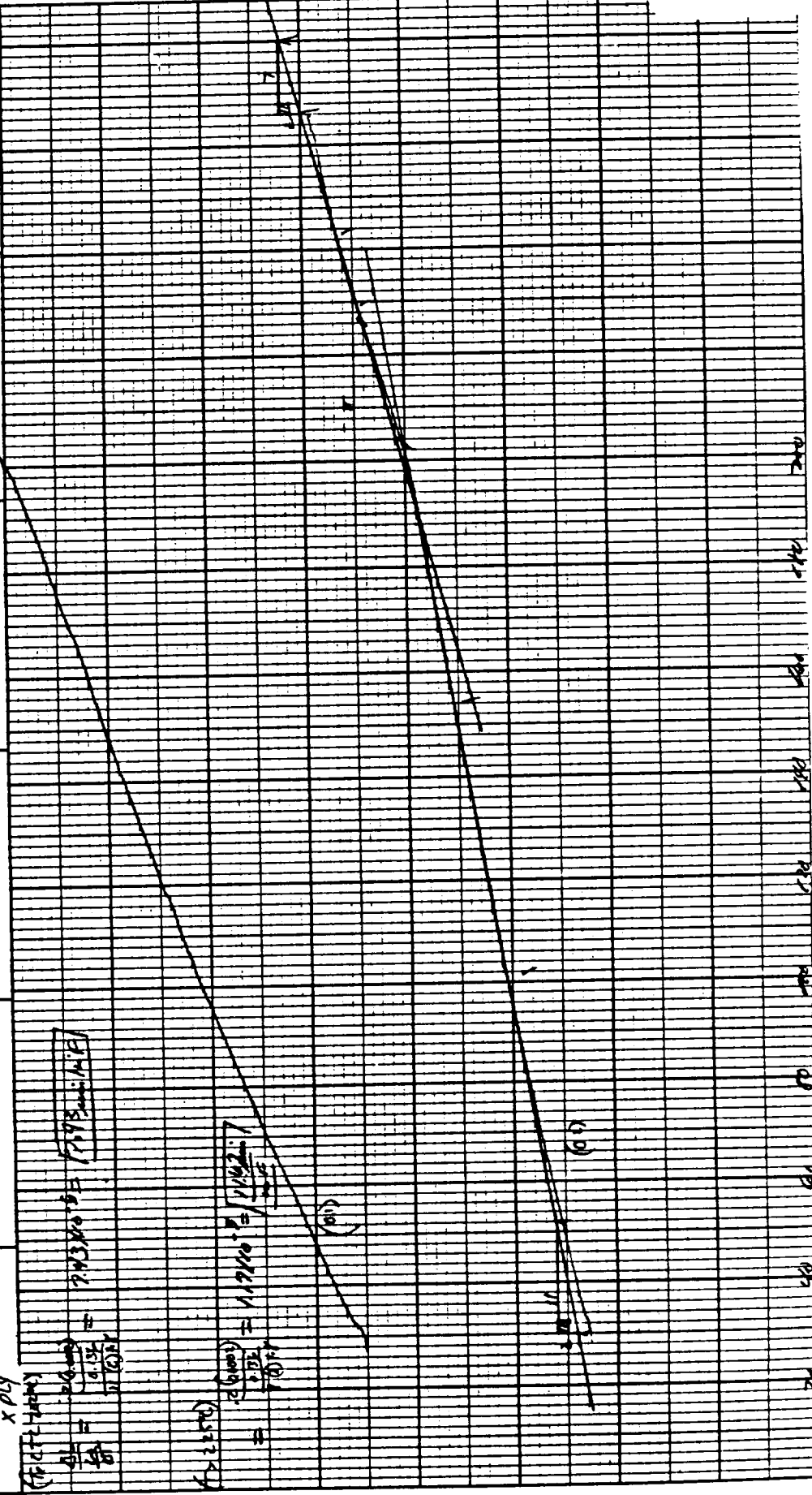
LOAD. g _____

dy, (10X), (mile/min)/hr.



PART NO. 940088

RUN NO. _____ OPERATOR <u>JD</u> SAMPLE <u>C6233-9-EMD-9</u> ATM. <u>2nd</u> <u>0-10</u> FLOW RATE <u>3.5XPH</u>	T-AXIS SCALE, °C/in. <u>20</u> PROG. RATE, °C/min <u>10</u> HEAT <u>COOL</u> <u>ISO</u> SHIFT, in. <u>0</u>	DTA-DSC SCALE, °C/in. _____ (mcal/sec)/in. _____ WEIGHT, mg _____ REFERENCE _____	TGA SCALE, mg/in. _____ SUPPRESSION, mg _____ WEIGHT, mg _____ TIME CONST., sec. _____ dY, (mg/min)/in. _____	TMA SCALE, mils/in. <u>0.1/0.2</u> MODE <u>EXTENDED</u> SAMPLE SIZE <u>1.0</u> LOAD, g <u>1</u> dY, (10X) (mils/min)/in. _____
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DUPOINT Instruments MEASURED VARIABLE

REPRODUCED FROM THE ORIGINAL RECORD OF THIS ANALYSIS

PART NO. 990088

RUN NO. DATE 5/14/84

OPERATOR 74

SAMPLE: Co₂133 - 5-3mer(-6)

ATM. Air @ STP

FLOW RATE 3.5 L/min

T-AXIS

SCALE: °C/in. 500

PROG. RATE: °C/min 20

HEAT: COOL ISO

SHIFT: in 0

DTA-DSC

SCALE: °C/in.

(mcal/sec)/in.

WEIGHT: mg

REFERENCE

TGA

SCALE: mg/in.

SUPPRESSION: mg

WEIGHT: mg

TIME CONST.: sec 15

dY: (mg/min)/in.

TMA

SCALE: mils/in. 0.1/0.2

MODE Expansion

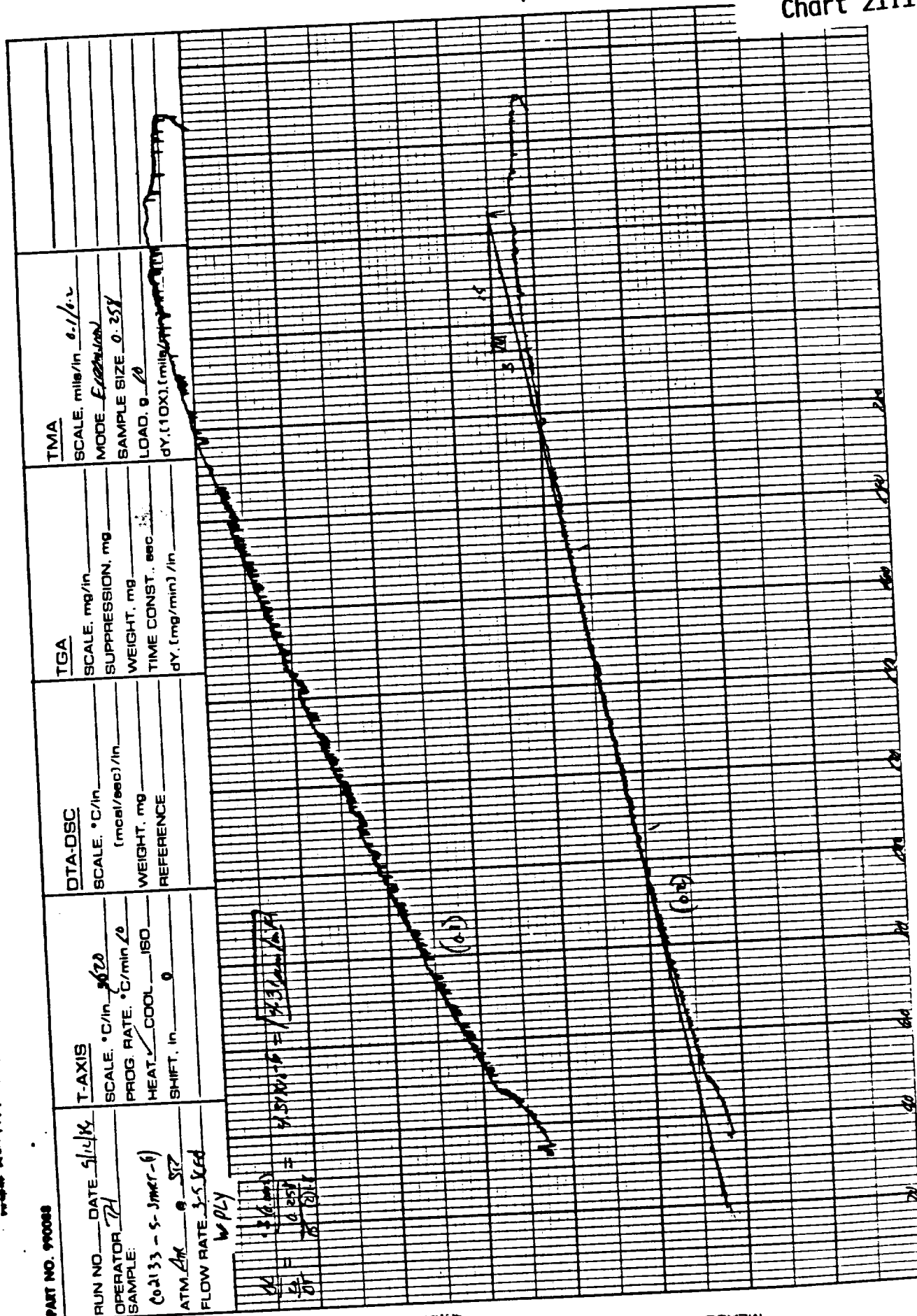
SAMPLE SIZE 0.25g

LOAD: g 10

dY: (10X) (mils)/in.

DU PONT Instruments

MEASURED VARIABLE

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MEASURED VARIABLE

PART NO. 990088

PRINT NO. DATE 9/12/96

OPERATOR

SAMPLE:

017133 -5-5mer-(2)

ATM 4x 3 5P

FLOW RATE 3-5 KPH

wply

T-AXIS

SCALE. • C/17 96 20

PROG. RATE. °C/min 20

HEAT ☒ COOL ☐ ISO-SHIFT, in 9

DTA-DSC

SCALE, °C/in. _____

(mcal/sec)/in.

WEIGHT, mg —

REFERENCE _____

TGA

SCALE. mg/in.

SUPPRESSION, mg.

WEIGHT, mg—

TIME CONST.: 000-

$dY: (mg/min) / In$

TMA

SCALE. mils/in 0.442

MODE English 0384

SAMPLE SIZE 0.05

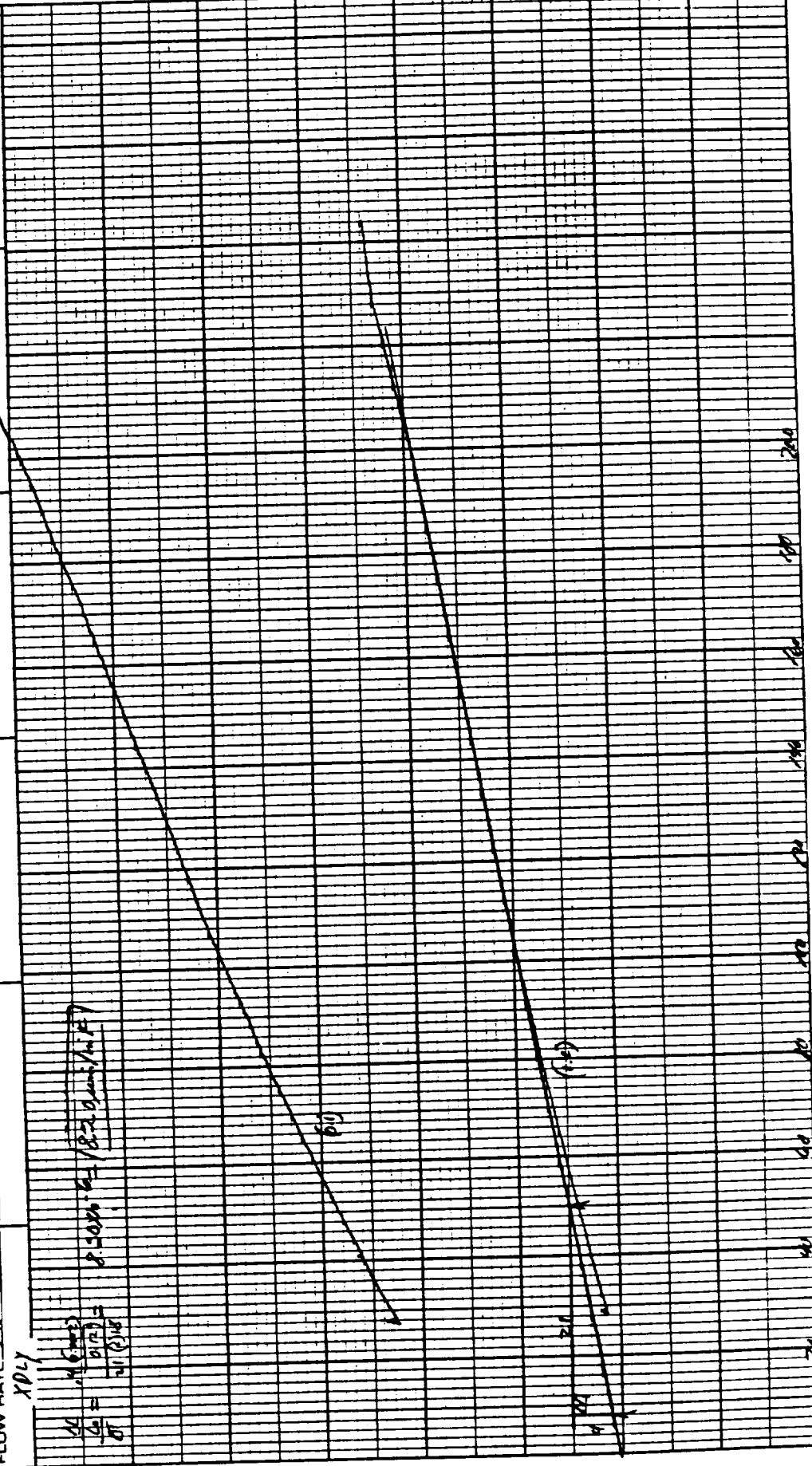
ROAD, 9

— 100 —



PART NO. 990088

RUN NO. <u>1/10</u> DATE <u>9/20</u> OPERATOR <u>JD</u> SAMPLE <u>CO2133 - 5-SMRT - (4)</u> ATM. <u>Atk</u> @ <u>SP</u> FLOW RATE <u>1.5X14</u>		T-AXIS SCALE °C/in <u>20</u> PROG. RATE °C/min <u>10</u> HEAT <input checked="" type="checkbox"/> COOL <u>150</u> SHIFT in <u>0</u>		DTA-DSC SCALE °C/in <u> </u> WEIGHT mg <u> </u> REFERENCE <u> </u>		TGA SCALE mg/in <u> </u> SUPPRESSION mg <u> </u> WEIGHT mg <u> </u> TIME CONST. sec <u>33</u> dY (mg/min) /in <u> </u>		TMA SCALE mils/in <u>0.1/0.2</u> MODE <u>Expander</u> SAMPLE SIZE <u>0.124</u> LOAD g <u>20</u> dY (10X) (mils/min) /in <u> </u>	
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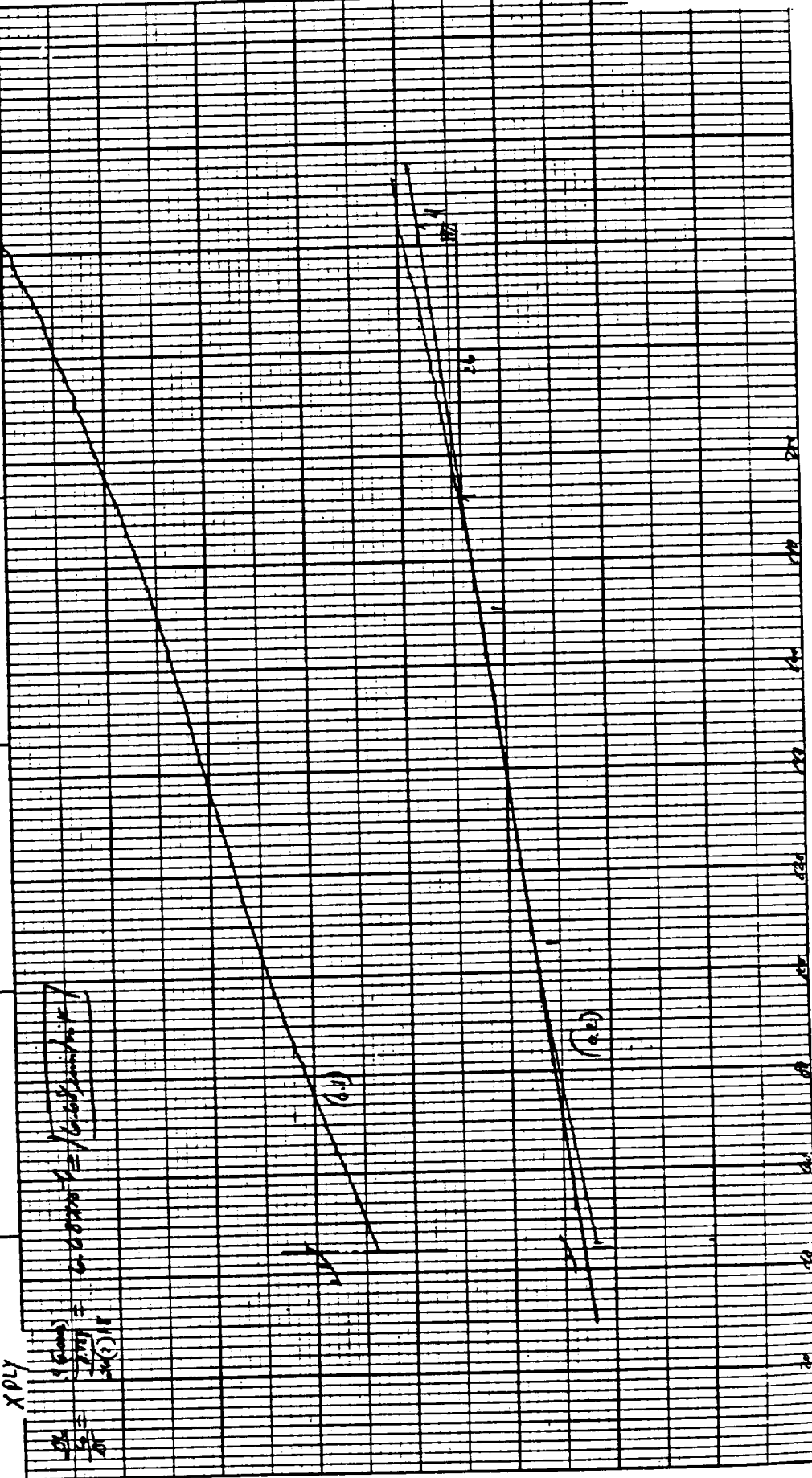


DUPONT Instruments

MEASURED VARIABLE
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 OF POOR QUALITY

PART NO. 990088

RUN NO. _____ DATE <u>9/15/86</u> OPERATOR <u>TH</u> SAMPLE: <u>CO2113 - 5-30000 - (5)</u> ATM <u>0.00</u> FLOW RATE <u>3.5 L/min</u>		T-AXIS SCALE: °C/in. <u>20</u> PROG. RATE: °C/min <u>1.0</u> HEAT <input checked="" type="checkbox"/> COOL <input type="checkbox"/> ISO <input type="checkbox"/> SHIFT: in <u>0</u>		DTA-DSC SCALE: °C/in. _____ (mcal/sec)/in. _____ WEIGHT, mg _____ REFERENCE _____		TGA SCALE, mg/in. _____ SUPPRESSION, mg _____ WEIGHT, mg _____ TIME CONST., sec. _____ dY, (mg/min)/in. _____		TMA SCALE, mils/in. <u>0.1/62</u> MODE <u>Elastic</u> SAMPLE SIZE <u>0.128</u> LOAD, g <u>1</u> dY, (10X), (mils/min)/in. _____	
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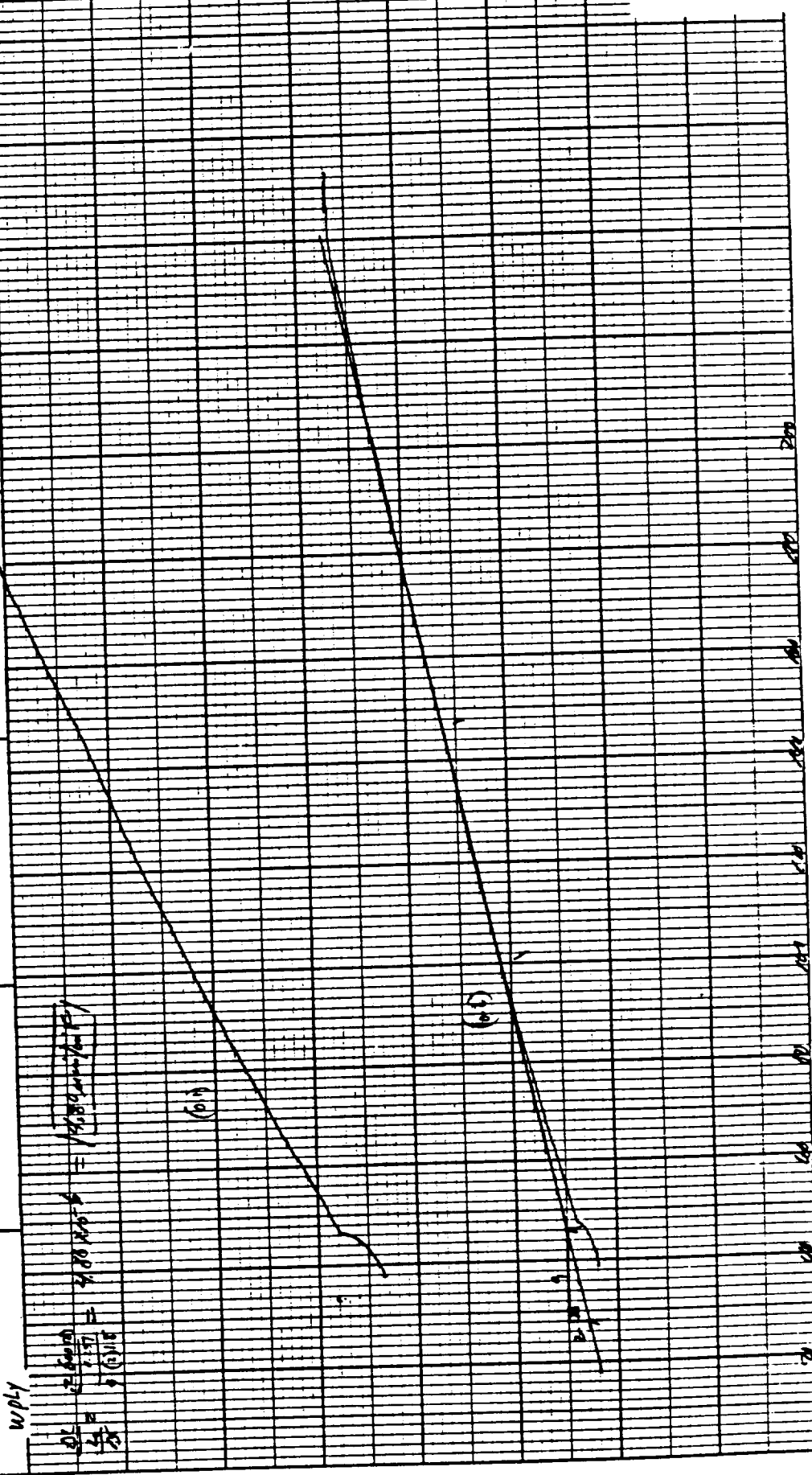


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MEASURED VARIABLE
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PART NO. 990088

RUN NO. <u>51114</u> OPERATOR <u>771</u> SAMPLE: <u>CO2133-5-502r (1)</u> ATM. <u>44</u> @ <u>500</u> FLOW RATE <u>3-55 (5)</u>	T-AXIS SCALE: °C/in. <u>50/21</u> PROG. RATE: °C/min. <u>10</u> HEAT <u>COOL</u> <u>180</u> SHIFT, in. <u>0</u>	DTA-DSC SCALE: °C/in. <u>(mcal/sec)/in</u> WEIGHT, mg <u>REFERENCE</u>	TGA SCALE, mg/in. <u>10</u> SUPPRESSION, mg <u>10</u> WEIGHT, mg <u>10</u> TIME CONST., sec. <u>10</u> dY, (mg/min) / in <u>10X1 (mils/min) / in</u>	TMA SCALE, mils/in. <u>0.1/10</u> MODE <u>Cellulose</u> SAMPLE SIZE <u>0.257</u> LOAD, g <u>10</u>
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OF POOR QUALITY

PART NO. 990086

RUN NO. DATE 9/12/66

OPERATOR TR

SAMPLE: 002133-5-500 (2)

ATMOSPHERE STP

FLOW RATE 3.5X64

T-AXIS

SCALE, °C/in 50/2A

PROG. RATE, °C/min 10

HEAT COOL ISO

SHIFT, in 0

DTA-DSC

SCALE, °C/in

(mcal/sec)/in

WEIGHT, mg

REFERENCE

TGA

SCALE, mg/in

SUPPRESSION, mg

WEIGHT, mg

TIME CONST, sec

dY, (mg/min)/in

TMA

SCALE, mils/in 0.16.2

MODE EXPANDED

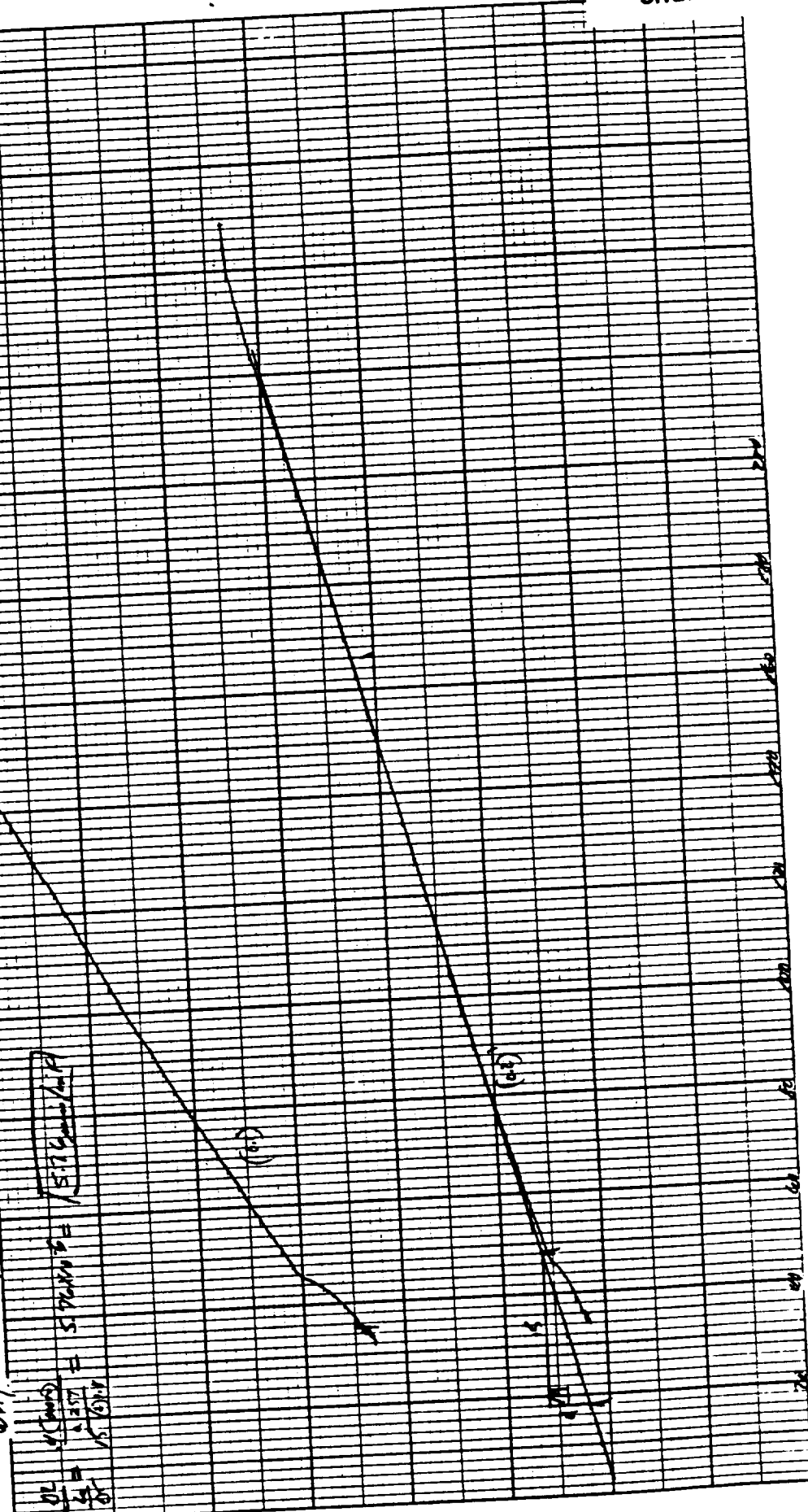
SAMPLE SIZE 0.259

LOAD, g 10

dY, (10X), (mils/min)/in

$$\frac{dY}{dt} = \frac{1.257}{15.614} = 5.76 \times 10^{-2} = 5.76 \text{ mg/min/in}$$

WPM

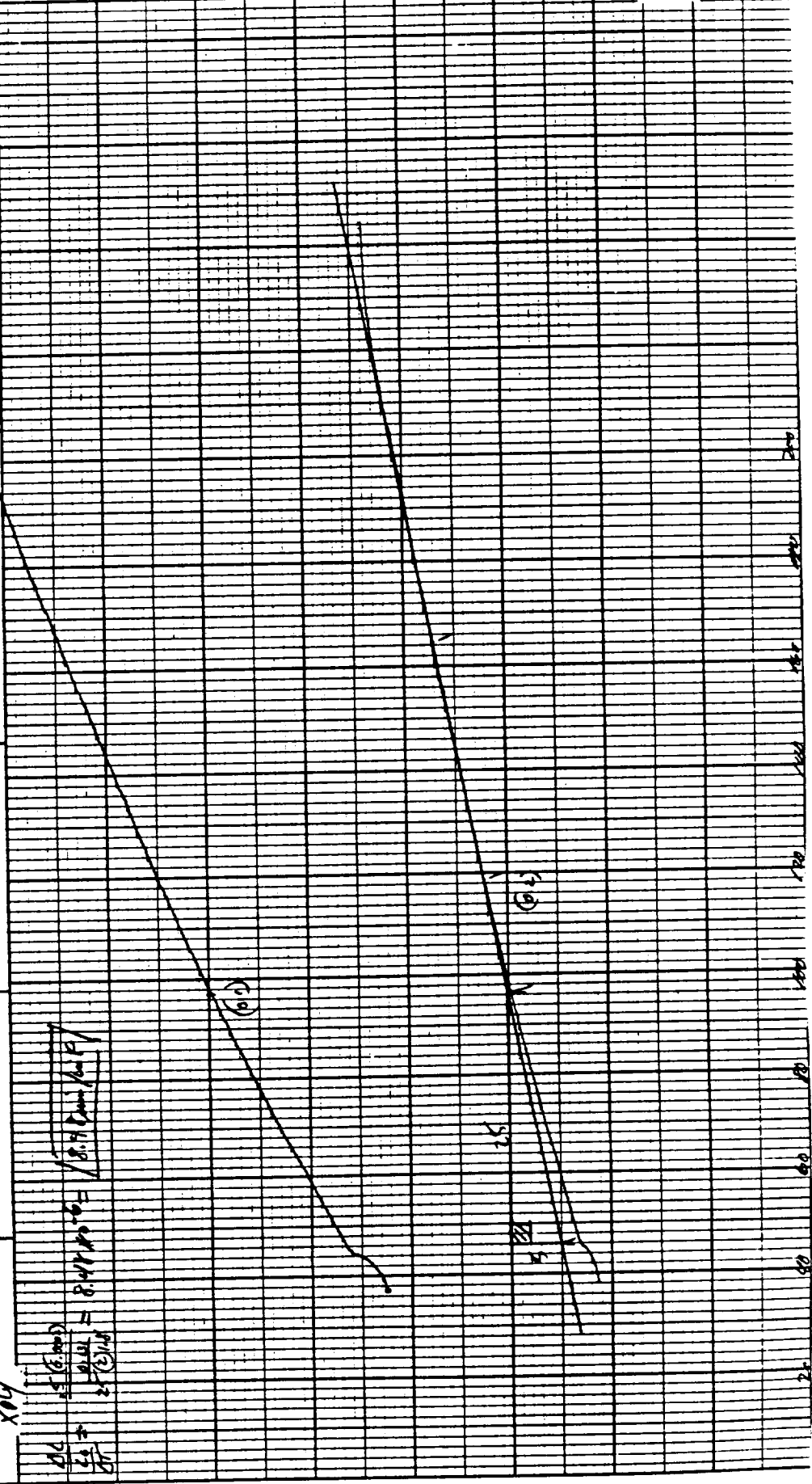


DU PONT Instruments MEASURED VARIABLE

ORIGINAL PAGE IS OF POOR QUALITY

PART NO. 990088

RUN NO. <u>DATE 5/15/76</u> OPERATOR <u>DA</u> SAMPLE <u>Co 2133-5-Exp-4</u> ATM <u>24</u> @ <u>XP</u> FLOW RATE <u>3.5 SCCH</u>		T-AXIS SCALE, °C/in. <u>50/20</u> PROG. RATE, °C/min <u>10</u> HEAT <u>✓</u> COOL <u>ISO</u> SHIFT, in. <u>0</u>		DTA-DSC SCALE, °C/in. <u>(mcal/sec)/in</u> WEIGHT, mg <u>REFERENCE</u>		TGA SCALE, mg/in. <u>0.1/0.2</u> SUPPRESSION, mg <u>0.13</u> WEIGHT, mg <u>0.13</u> TIME CONST., sec. <u>0</u> dY, (mg/min) / in. <u>0</u>		TMA SCALE, mils/in. <u>0.1/0.2</u> MODE <u>0.13</u> SAMPLE SIZE <u>0.13</u> LOAD, g <u>0</u> dY, (10X) (mils/min) / in. <u>0</u>	
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DU PONT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
OF SEVEN PAGES

PART NO. 990088

RUN NO. 91116
DATE 7/1/76
OPERATOR TL
SAMPLE CA2133-5-6-10-(5)
ATM. 20 @ 30
FLOW RATE 35.5 (cc)

T-AXIS
SCALE: °C/in. 30-20
PROG. RATE: °C/min 10
HEAT / COOL ISO
SHIFT, in. 0

DTA-DSC

SCALE: °C/in.
(mcal/sec)/in.
WEIGHT, mg
REFERENCE

TGA

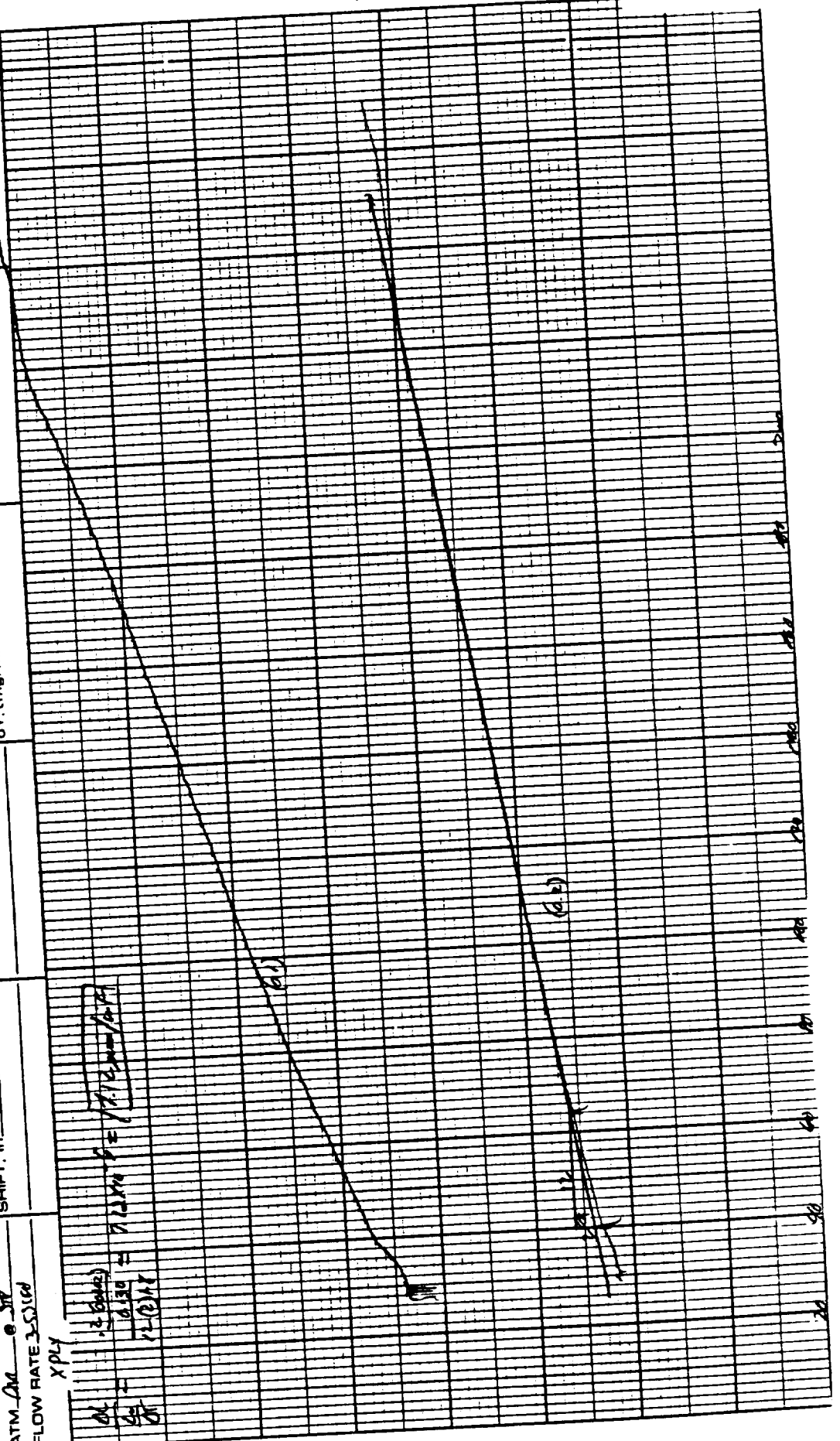
SCALE, mg/in.
SUPPRESSION, mg
WEIGHT, mg
TIME CONST., sec
dV, (mg/min)/in

TMA

SCALE, mils/in. 0.1/0.2
MODE EXPANSION
SAMPLE SIZE 0.130
LOAD, g 10
dV, (10X) (mils/min)/in

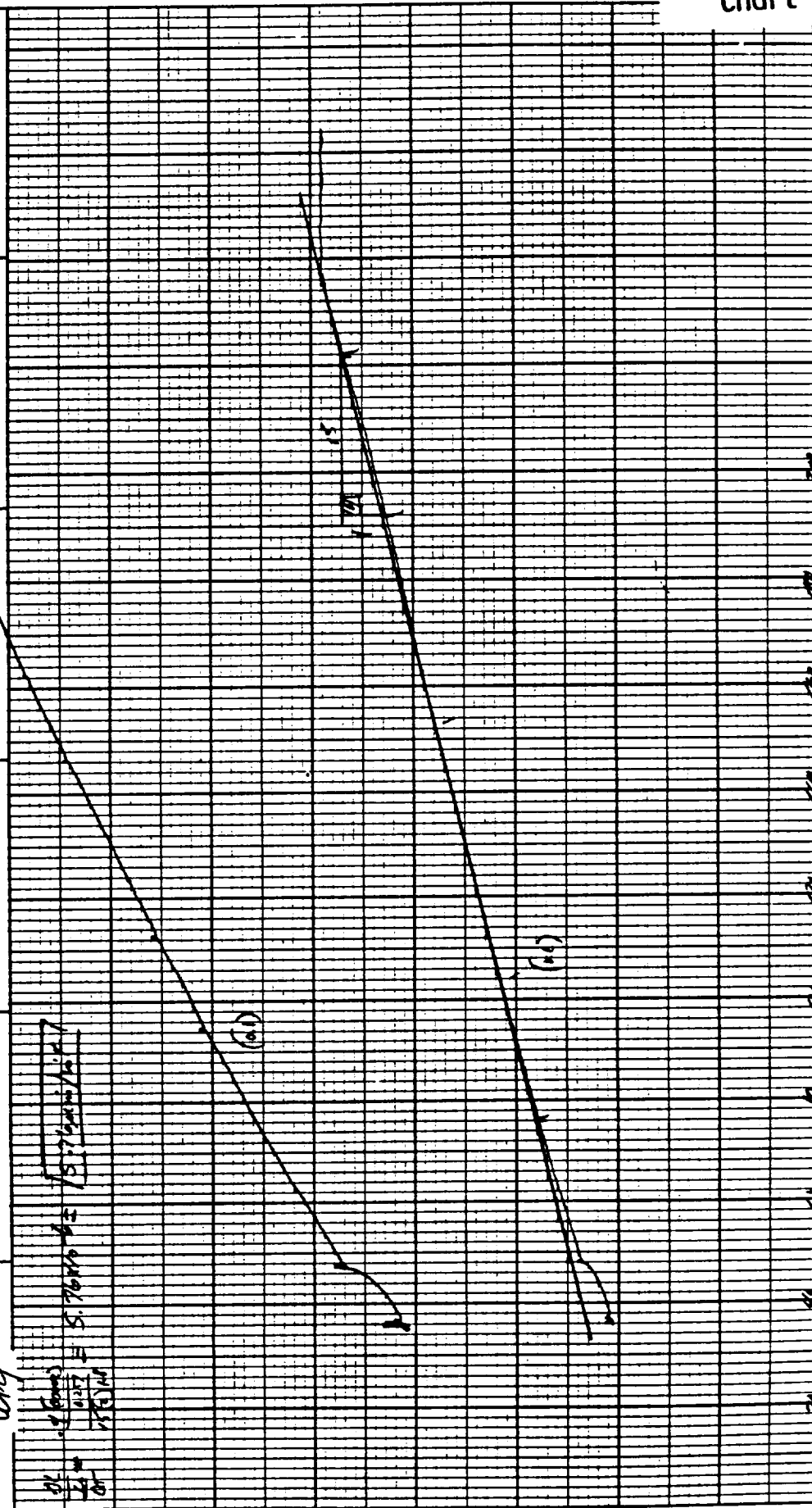
DU PONT Instruments MEASURED VARIABLE

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PART NO. 990088

RUN NO. <u>DATE 5/12/84</u>	DTA-DSC	TGA	TMA
OPERATOR <u>TH</u>	SCALE: °C/in <u>50.24</u>	SCALE: mg/in <u>5.000</u>	SCALE: mils/in <u>5.000</u>
SAMPLE: <u>CO2133 - 6-5mm - (1)</u>	PROG. RATE: °C/min <u>10</u>	SUPPRESSION: mg	MODE: <u>Static</u>
HEAT <input checked="" type="checkbox"/> COOL <input type="checkbox"/> ISO	WEIGHT: mg	WEIGHT: mg	SAMPLE SIZE <u>0.389 0.257</u>
SHIFT: in <u>0</u>	REFERENCE	TIME CONST.: sec	LOAD: g
ATM <u>20</u> @ <u>577</u>		dY: (mg/min) / in	dY: (10X) (mils/min) / in
FLOW RATE <u>3.55 L/min</u>			



DUPOINT Instruments

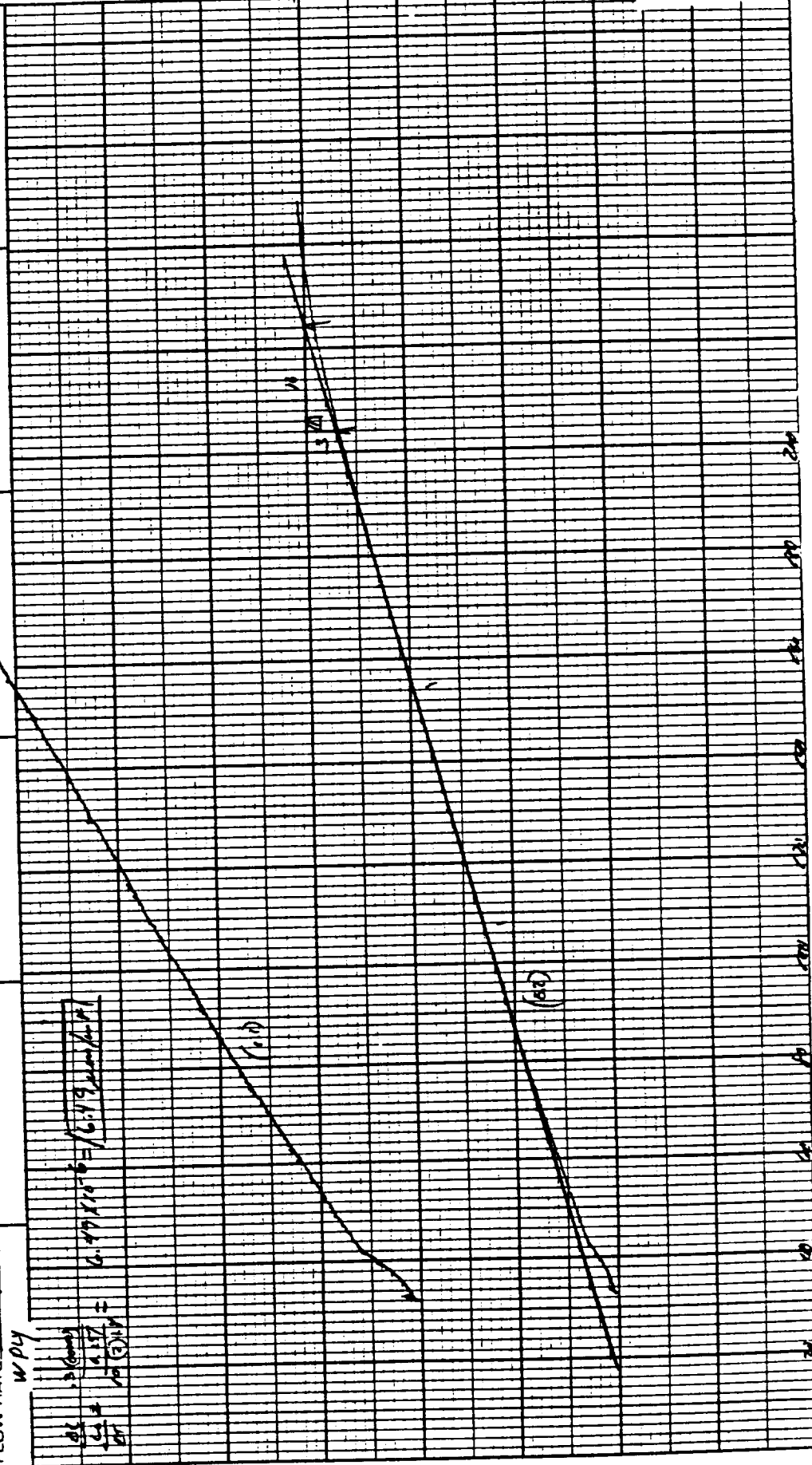
DUPOINT

MEASURED VARIABLE

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OF POOR QUALITY

PART NO. 900088

RUN NO. _____ DATE 9/12/84 OPERATOR TH SAMPLE: CO2133-6-SMKT-(2) ATM. 240 0-577 FLOW RATE 5.5X48	T-AXIS SCALE: °C/in 50/24 PROG. RATE: °C/min 1 HEAT COOL ISO SHIFT: In 0	DTA-DSC SCALE: °C/in (mcal/sec)/in WEIGHT: mg REFERENCE	TGA SCALE: mg/in SUPPRESSION: mg WEIGHT: mg TIME CONST.: sec dY: (mg/mil)/in	TMA SCALE: mils/in 0.1/0.2 MODE Expansion SAMPLE SIZE 0.257 LOAD: g 1 dY: (10X) (mils/min)/in
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DU PONT Instruments

MEASURED VARIABLE

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PART NO. 990088

RUN NO. 21440
 OPERATOR PI
 SAMPLE: CO2133-6-Sinter-(4)
 ATM. Am @ SL
 FLOW RATE 3.5XCH

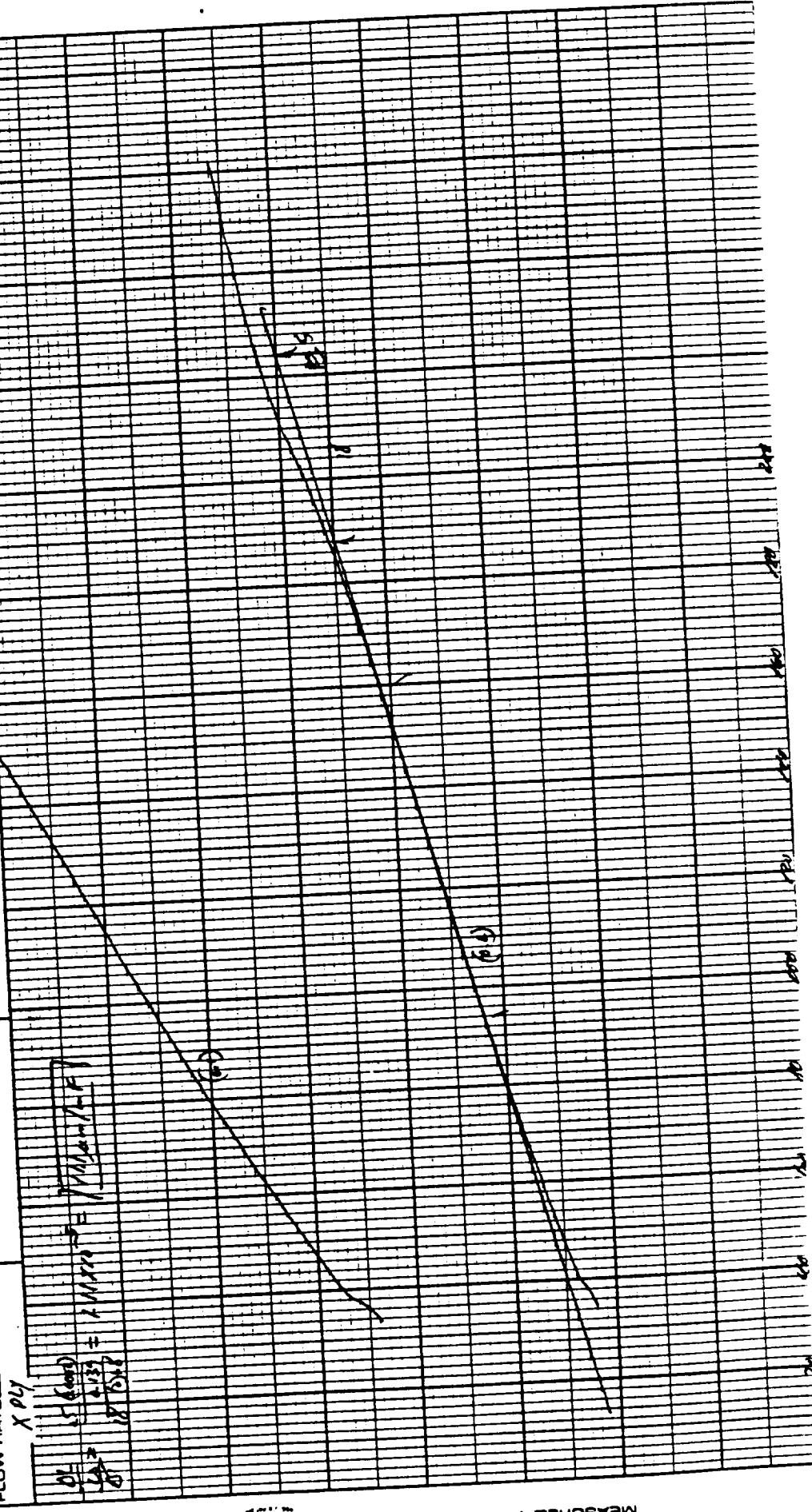
T-AXIS
 SCALE: °C/in. 50/20
 PROG. RATE: °C/min 10
 HEAT / COOL ISO
 SHIFT: in. 0

DTA-OSC
 SCALE: °C/in. (mcal/sec)/in.
 WEIGHT: mg
 REFERENCE

TGA
 SCALE: mg/in.
 SUPPRESSION: mg
 WEIGHT: mg
 TIME CONST: /sec
 dY: (mg/dm) /in.

TMA
 SCALE: mils/in. 0.1/0.1
 MODE EXTENDED
 SAMPLE SIZE 0.139
 LOAD: g 10
 dY: (10X) (mils/min) /in.

$\frac{dY}{dt} = \frac{5.6 \text{ mg}}{18 \text{ min}} = 0.311 \text{ mg/min}$
 $\frac{dY}{dt} = 2.11 \text{ mg/min} = 7.11 \text{ g/hr}$

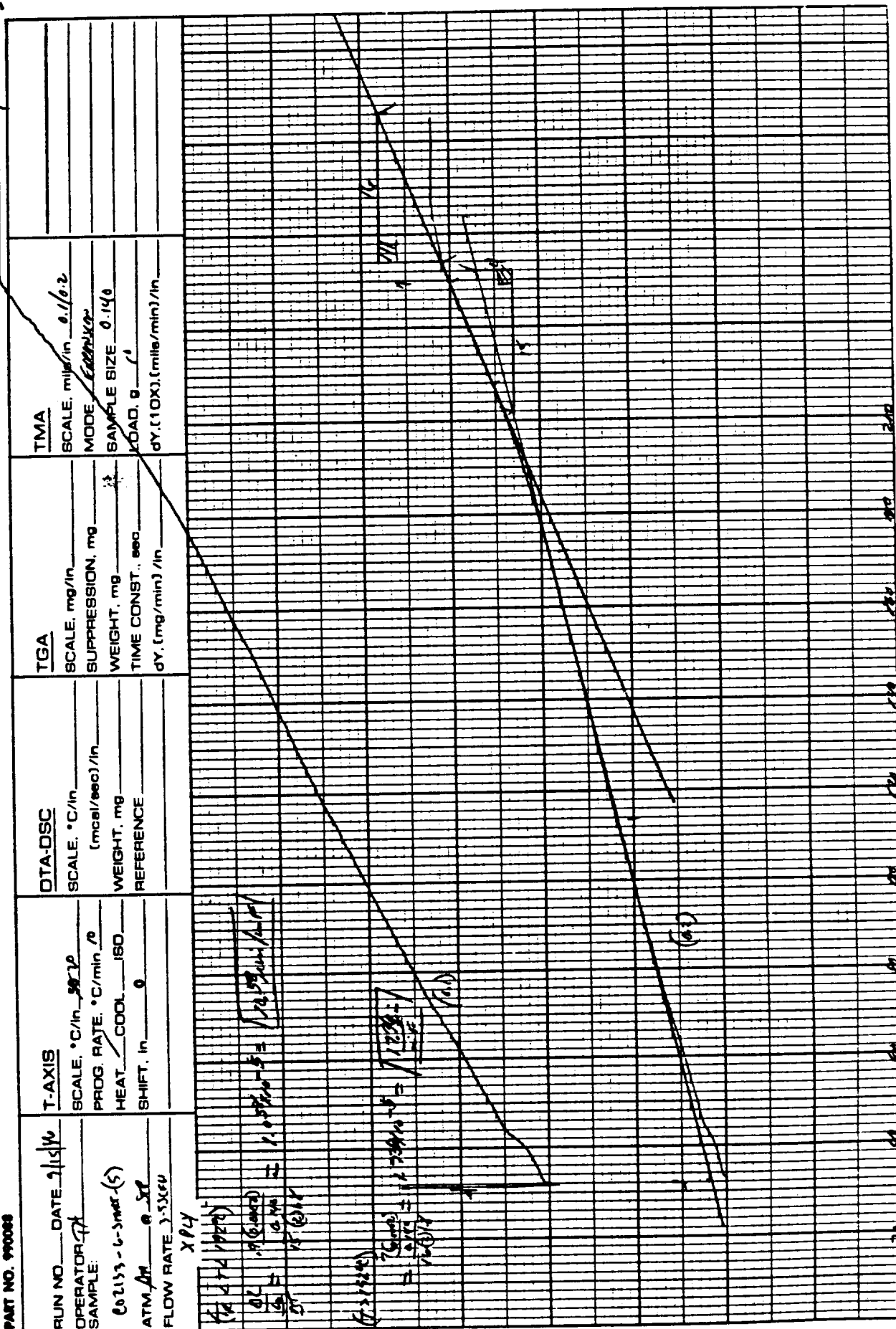


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MEASURED VARIABLE

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PART NO. 990088



MEASURED VARIABLE

ORIGINAL PAGE IS
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PART NO. 990088

RUN NO. DATE 9/12/86
 OPERATOR JH
 SAMPLE C02133-6-END-(1)
 ATM. PR. @ STP
 FLOW RATE 3.55 (GAL)

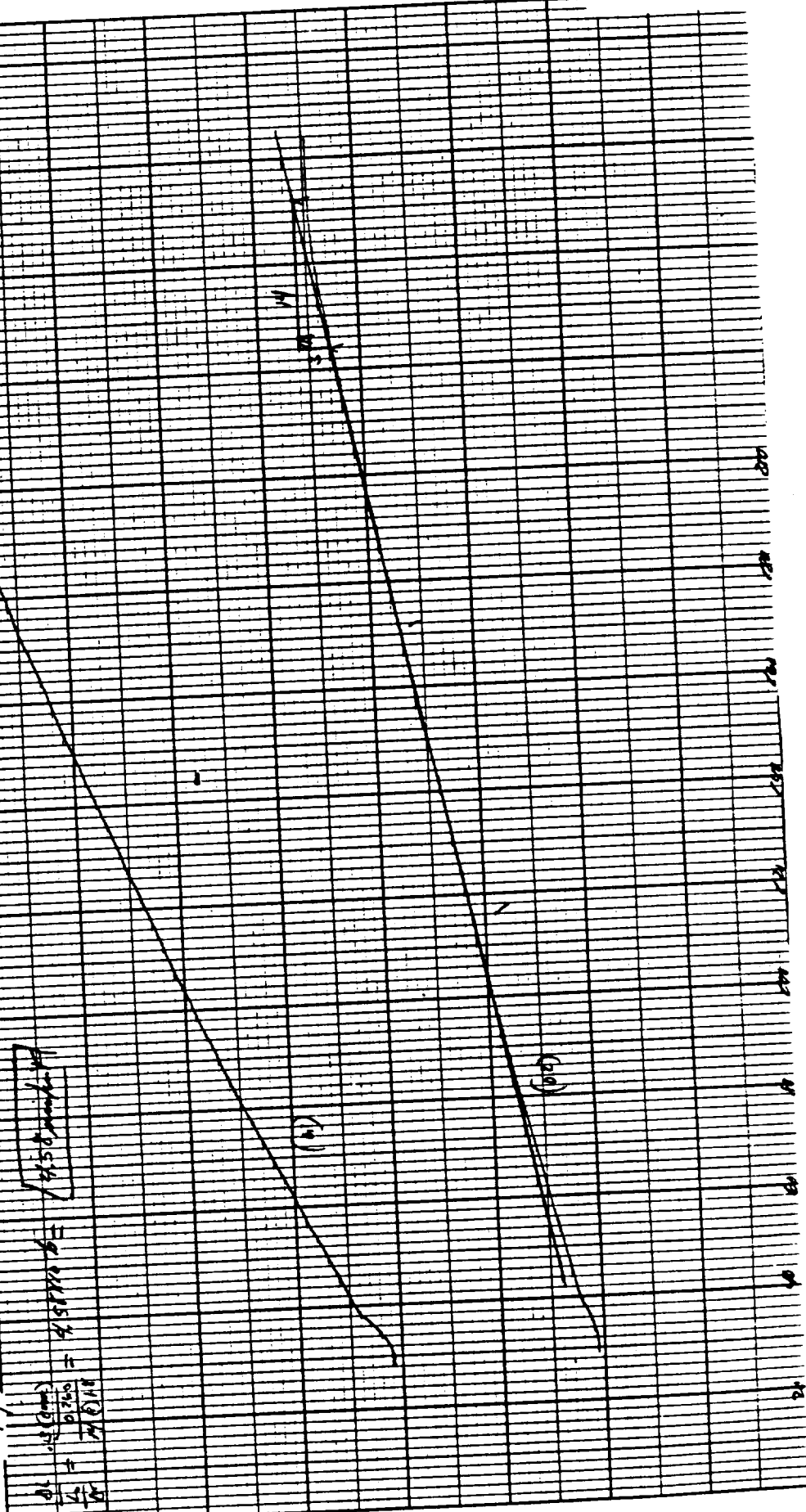
T-AXIS
 SCALE °C/in. 20
 PROG. RATE °C/min 10
 HEAT COOL ISO
 SHIFT in 0

DTA-DSC
 SCALE °C/in. (mcal/sec)/in.
 WEIGHT, mg
 REFERENCE

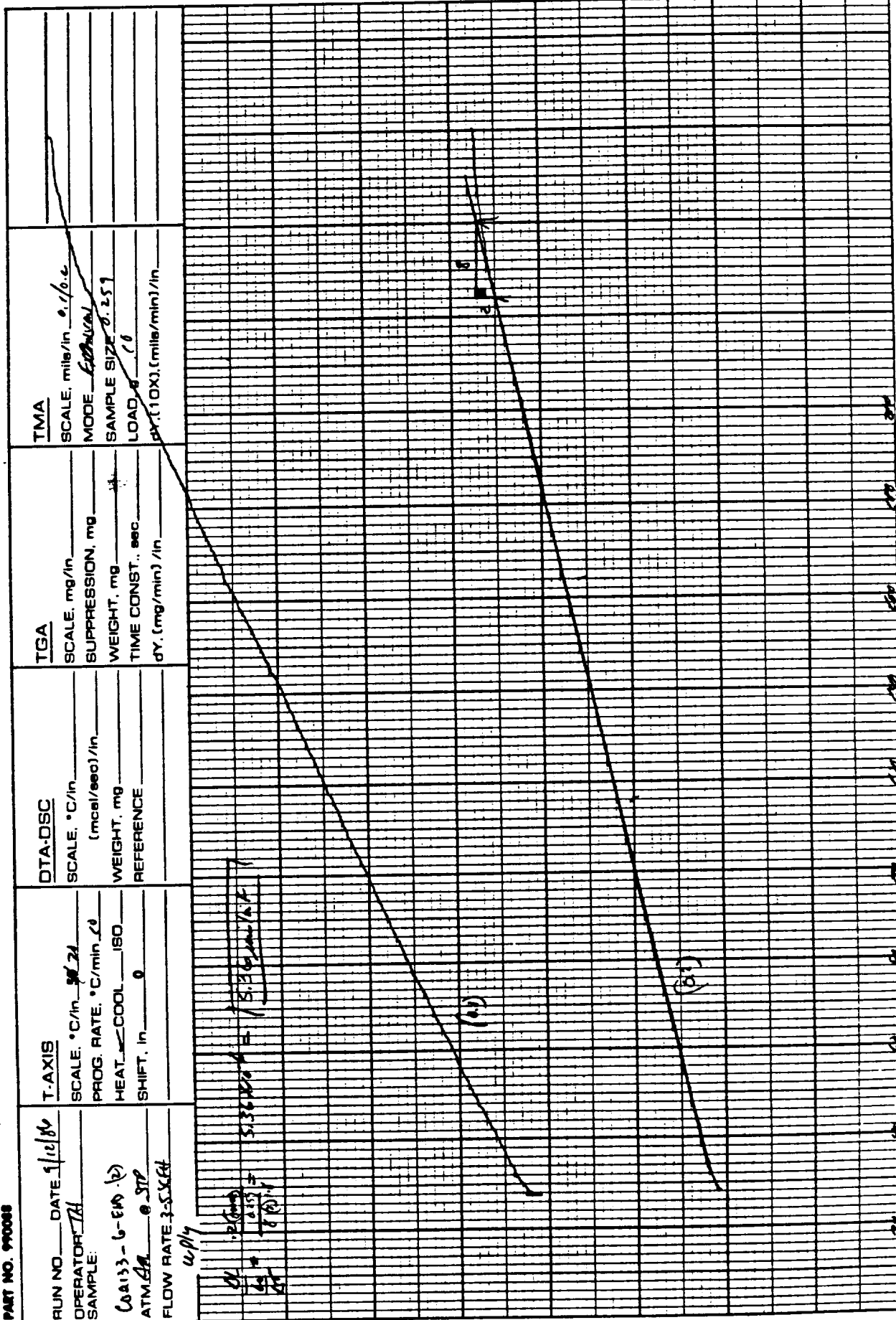
TGA
 SCALE, mg/in.
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec.
 dY, (mg/min)/in.

TMA
 SCALE, mils/in. 0.1/0.2
 MODE Expansion
 SAMPLE SIZE 0.260
 LOAD, g 10
 dY, (10X) (mils/min)/in.

Wt 17
 $\frac{0.1}{1.5} = \frac{0.260}{4.58} = 4.58 \text{ mils/in.}$



PART NO. 990088



DU PONT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
OF POOR QUALITY

PART NO. 990088

RUN NO. <u>7/15/70</u> OPERATOR <u>PH</u> SAMPLE: <u>CO2L33-6-EO-(4)</u> ATM. <u>PH</u> @ <u>SP</u> FLOW RATE <u>3.55 L/H</u> XPLV	T-AXIS SCALE, °C/in. <u>50/20</u> PROG. RATE, °C/min. <u>0</u> HEAT <input checked="" type="checkbox"/> COOL <input type="checkbox"/> ISO <input type="checkbox"/> SHIFT, in. <u>0</u>	DTA-DSC SCALE, °C/in. <u>(mol/sec)/in.</u> WEIGHT, mg <u>REFERENCE</u>	TGA SCALE, mg/in. <u>0.1/0.2</u> SUPPRESSION, mg <u>0.0001/mg</u> WEIGHT, mg <u>0.13</u> TIME CONST., sec <u>1</u> dY, (mg/min)/in. <u>0</u>	TMA SCALE, mils/in. <u>0.1/0.2</u> MODE <u>0.0001/mg</u> SAMPLE SIZE <u>0.13</u> LOAD, g <u>0</u> dY, (10X) (mils/min)/in. <u>0</u>
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$\frac{dL}{dt} = \frac{0.13}{2.5} = 0.052$
 $\frac{dL}{dt} = 0.052 \text{ (in/min)}$
 $\frac{dL}{dt} = 1.05 \times 10^{-3} = 1.05 \text{ (in/min)}$

DU PONT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
OF POOR QUALITY

PART NO. 990088

RUN NO. DATE 9/1/80

OPERATOR TH

SAMPLE:

CO2133 - 6-5m (5)

ATM. Air @ 3rd

FLOW RATE 3.5X104

T-AXIS

SCALE, °C/in. 90 20

PROG. RATE, °C/min 10

HEAT COOL ISO

SHIFT, in 0

DTA-DSC

SCALE, °C/in. (mcal/sec)/in

WEIGHT, mg

REFERENCE

TGA

SCALE, mg/in

SUPPRESSION, mg

WEIGHT, mg

TIME CONST., sec

dY, (mg/min) /in

TMA

SCALE, mils/in 0.1/1.2

MODE EXAMIN

SAMPLE SIZE 0.132

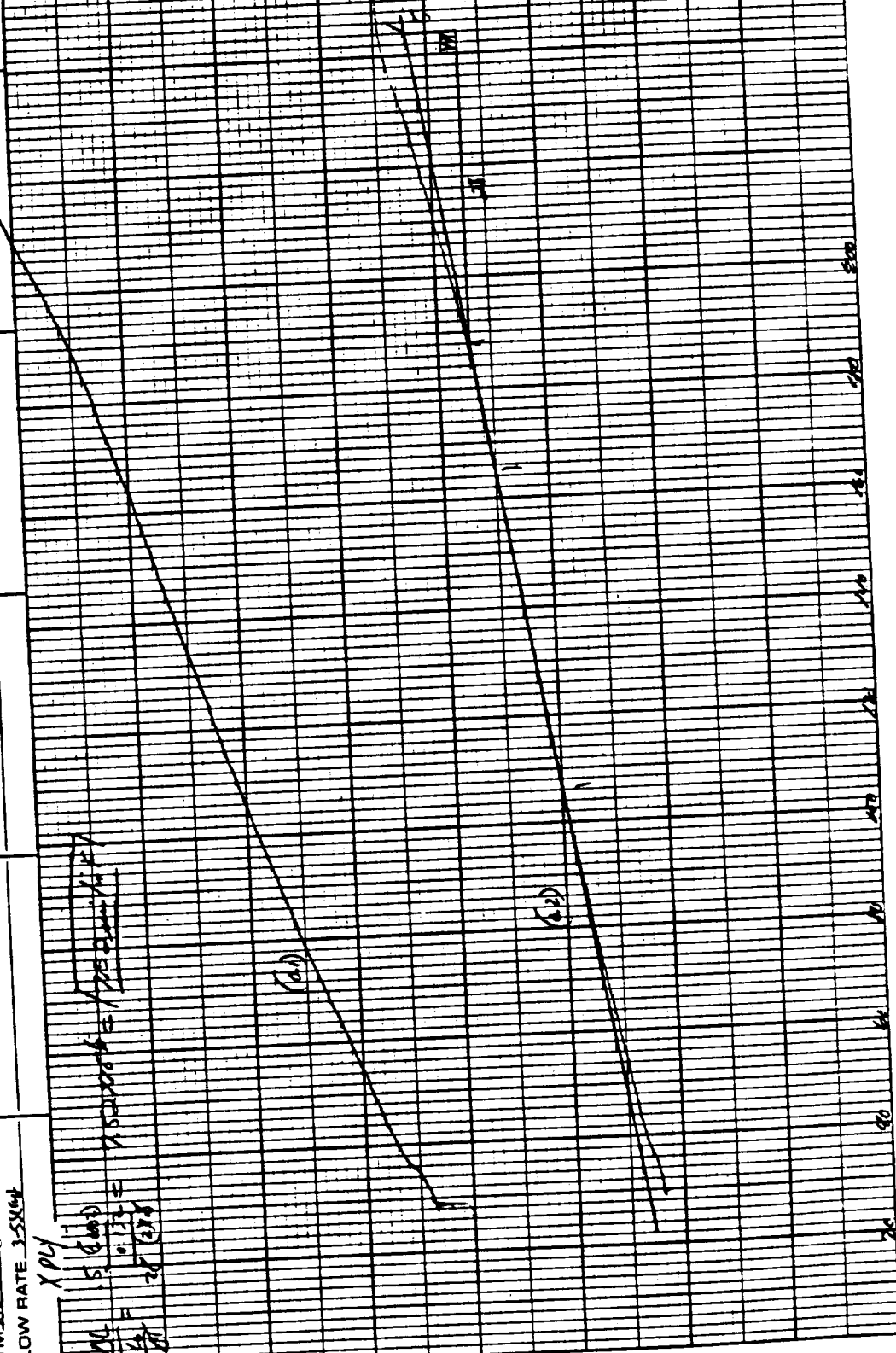
LOAD, g 16

dY, (10X) (mils/gram) /in

DU PONT Instruments

MEASURED VARIABLE

ORIGINAL PAGE IS
OF POOR QUALITY



PART NO. 990088

RUN NO. 111 DATE 1/11/74
 OPERATOR TX
 SAMPLE: C62133-7-Symet-(6)
 ATM 400 0.37
 FLOW RATE 3.5 MPA

T-AXIS
 SCALE, °C/in 30/20
 PROG. RATE, °C/min 20
 HEAT COOL ISO
 SHIFT, in 0

DTA-DSC
 SCALE, °C/in
 (mcal/sec)/in
 WEIGHT, mg
 REFERENCE

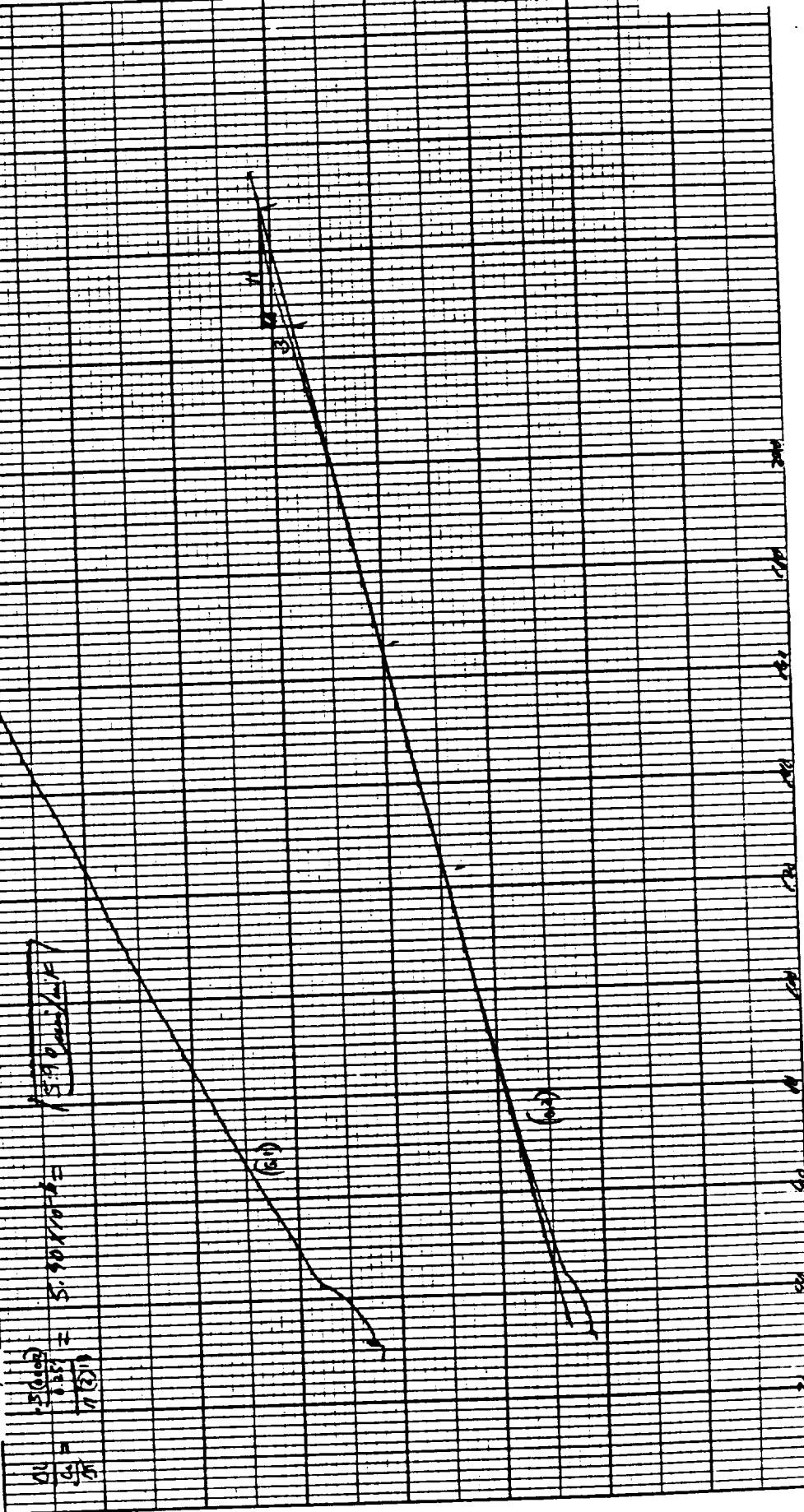
TGA
 SCALE, mg/in
 SUPPRESSION, mg
 WEIGHT, mg
 TIME CONST., sec
 dY, (mg/min)/in

TMA
 SCALE, mils/in 0.1/0.2
 MODE EXPANSION
 SAMPLE SIZE 0.357
 LOAD, g 10
 dY, (10X), (mils/min)/in

$$\frac{1.50(100)}{0.357} = 5.90 \times 10^4$$

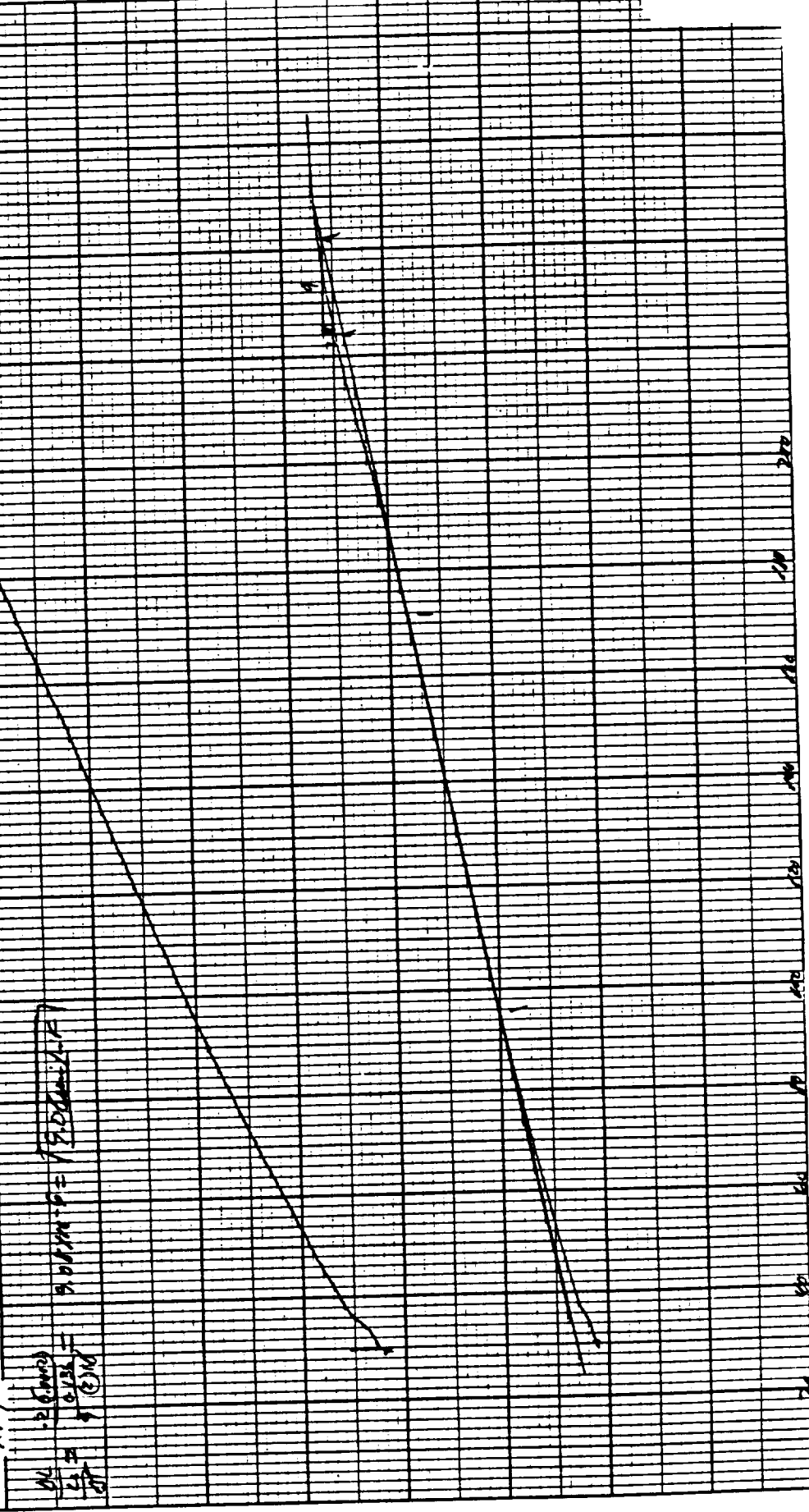
$$\frac{1.50(100)}{0.357} = 5.90 \times 10^4$$

WPK



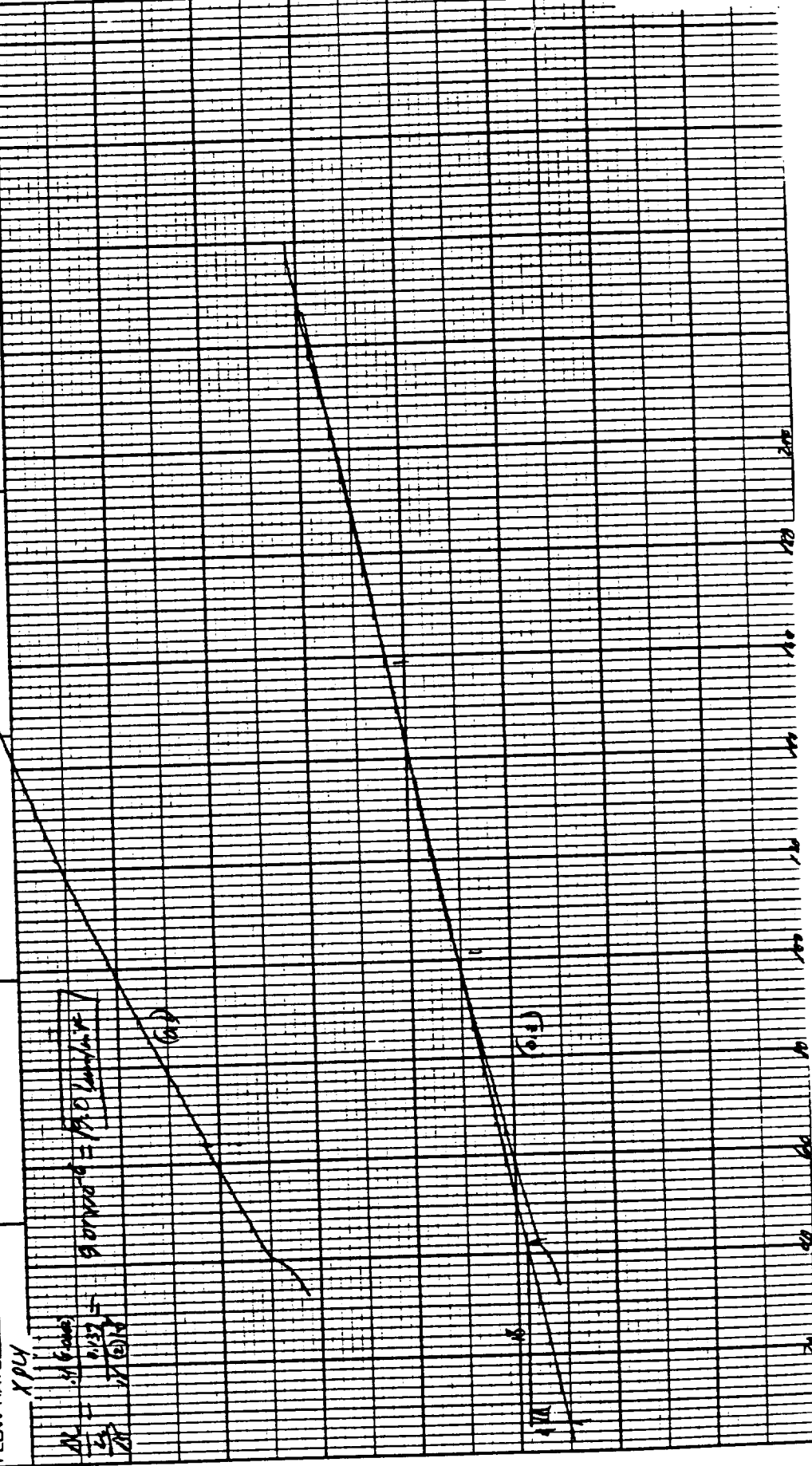
PART NO. 990088

RUN NO. <u>91314</u> OPERATOR <u>JD</u> SAMPLE <u>Cr213-7-SAME-4</u> ATM. <u>Del</u> <u>0-500</u> FLOW RATE <u>2.5</u>	T-AXIS SCALE: °C/in. <u>20</u> PROG. RATE: °C/min <u>1</u> HEAT COOL <u>ISO</u> SHIFT, in. <u>0</u>	DTA-DSC SCALE: °C/in. <u>(mcal/sec)/in.</u> WEIGHT, mg <u>REFERENCE</u>	TGA SCALE, mg/in. <u>10</u> SUPPRESSION, mg <u>0</u> WEIGHT, mg <u>0.134</u> TIME CONST., sec <u>300</u> dY (mg/min) / in. <u>10</u>	TMA SCALE, mils/in. <u>0.102</u> MODE <u>600000</u> SAMPLE SIZE <u>0.134</u> LOAD, g <u>10</u> dY (10X) (mils/min) / in. <u>10</u>
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PART NO. 990088

RUN NO. <u>9110</u> OPERATOR <u>JD</u> SAMPLE <u>COU-37-5-mat-(5)</u> ATM. <u>PM</u> @ <u>500</u> FLOW RATE <u>3.584</u>		T-AXIS SCALE, °C/in. <u>50/10</u> PROG. RATE, °C/min. <u>10</u> HEAT <u>✓</u> COOL <u>ISO</u> SHIFT, in. <u>0</u>		DTA-DSC SCALE, °C/in. <u>(mcal/sec)/in</u> WEIGHT, mg <u>---</u> REFERENCE <u>---</u>		TGA SCALE, mg/in. <u>---</u> SUPPRESSION, mg <u>---</u> WEIGHT, mg <u>---</u> TIME CONST., sec <u>---</u> dY, (mg/min)/in <u>---</u>		TMA SCALE, mils/in. <u>0.1/12</u> MODE <u>EXPANSION</u> SAMPLE SIZE <u>0.137</u> LOAD, g <u>11</u> dY, (10X), (mils/min)/in <u>---</u>	
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PART NO. 990088

 RUN NO. DATE 9/10/74
 OPERATOR JH
 SAMPLE:

C0233-7-600-(1)

ATMOSP. 0.177

FLOW RATE 3.5 L/min

T-AXIS

 SCALE: °C/in. 20
 PROG. RATE: °C/min 10
 HEAT ☒ COOL ☐ ISO
 SHIFT: in 0

DTA-DSC

 SCALE: °C/in.
 (mcal/sec)/in.
 WEIGHT: mg
 REFERENCE

TGA

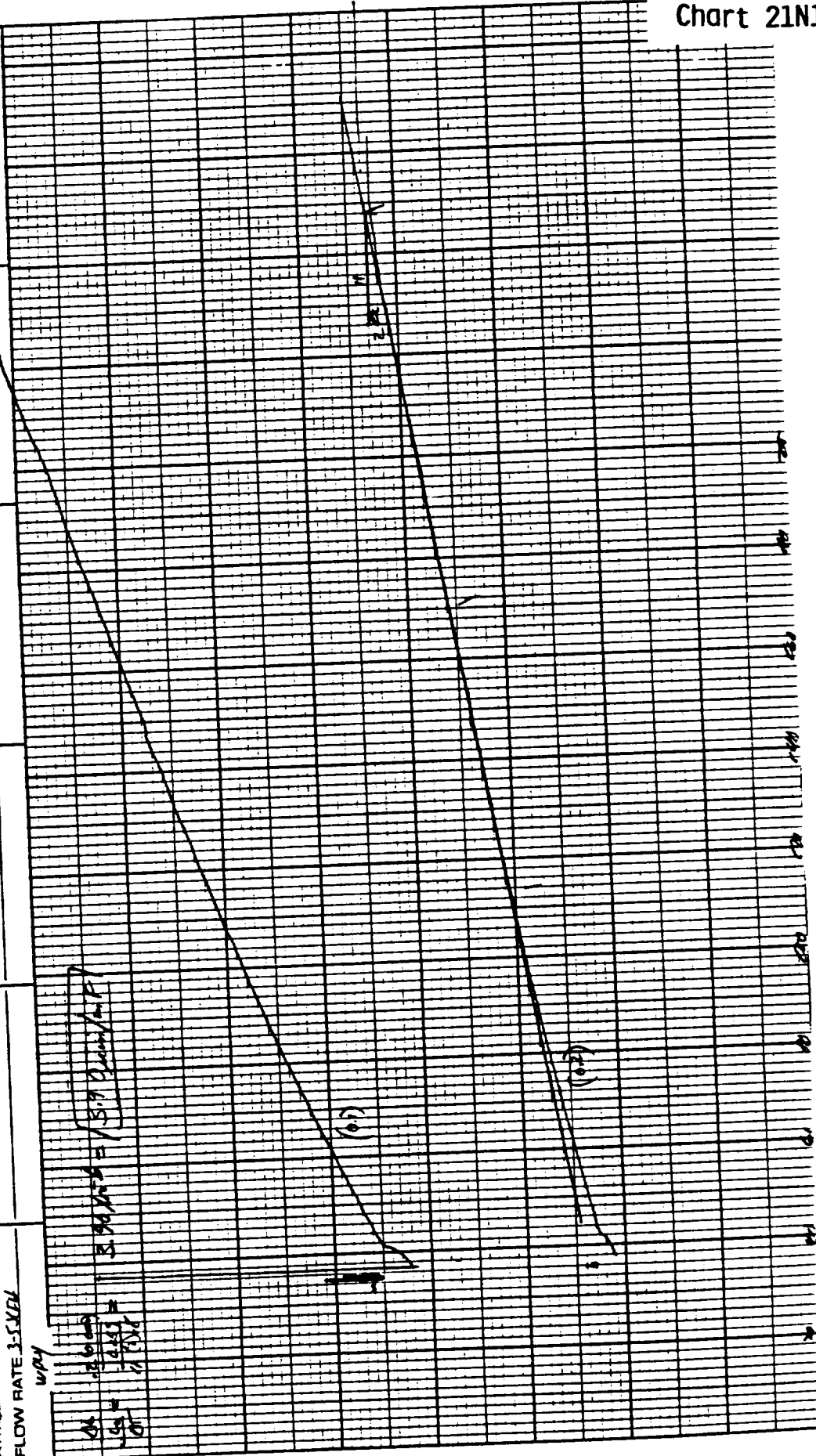
 SCALE: mg/in.
 SUPPRESSION: mg
 WEIGHT: mg
 TIME CONST.: sec
 dY: (mg/min) / in

TMA

 SCALE: mils/in. 0.1/0.2
 MODE Freeze/Thaw
 SAMPLE SIZE 0.259
 LOAD: g 10
 dY: (10X) (mils/min) / in

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 Instruments

MEASURED VARIABLE



PART NO: 990088

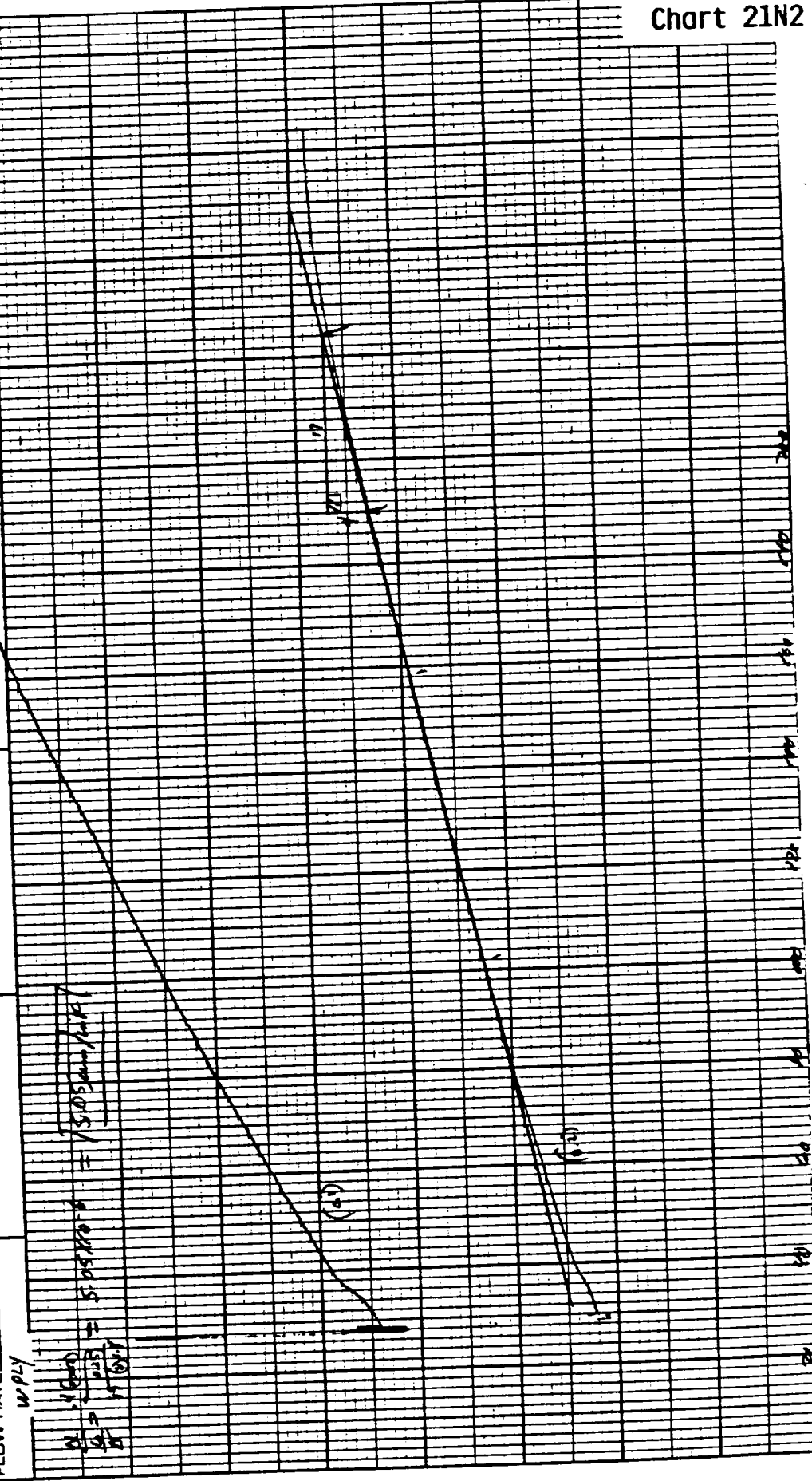
RUN NO. DATE 9/12/84
 OPERATOR TH
 SAMPLE: C02133-7-CAD (2)
 ATM Arg 0-577
 FLOW RATE 355SL

T-AXIS
 SCALE: °C/in 24
 PROG. RATE: °C/min 10
 HEAT: COOL 150
 SHIFT: in 0

DTA-DSC
 SCALE: °C/in
 (mcal/sec)/in
 WEIGHT: mg
 REFERENCE

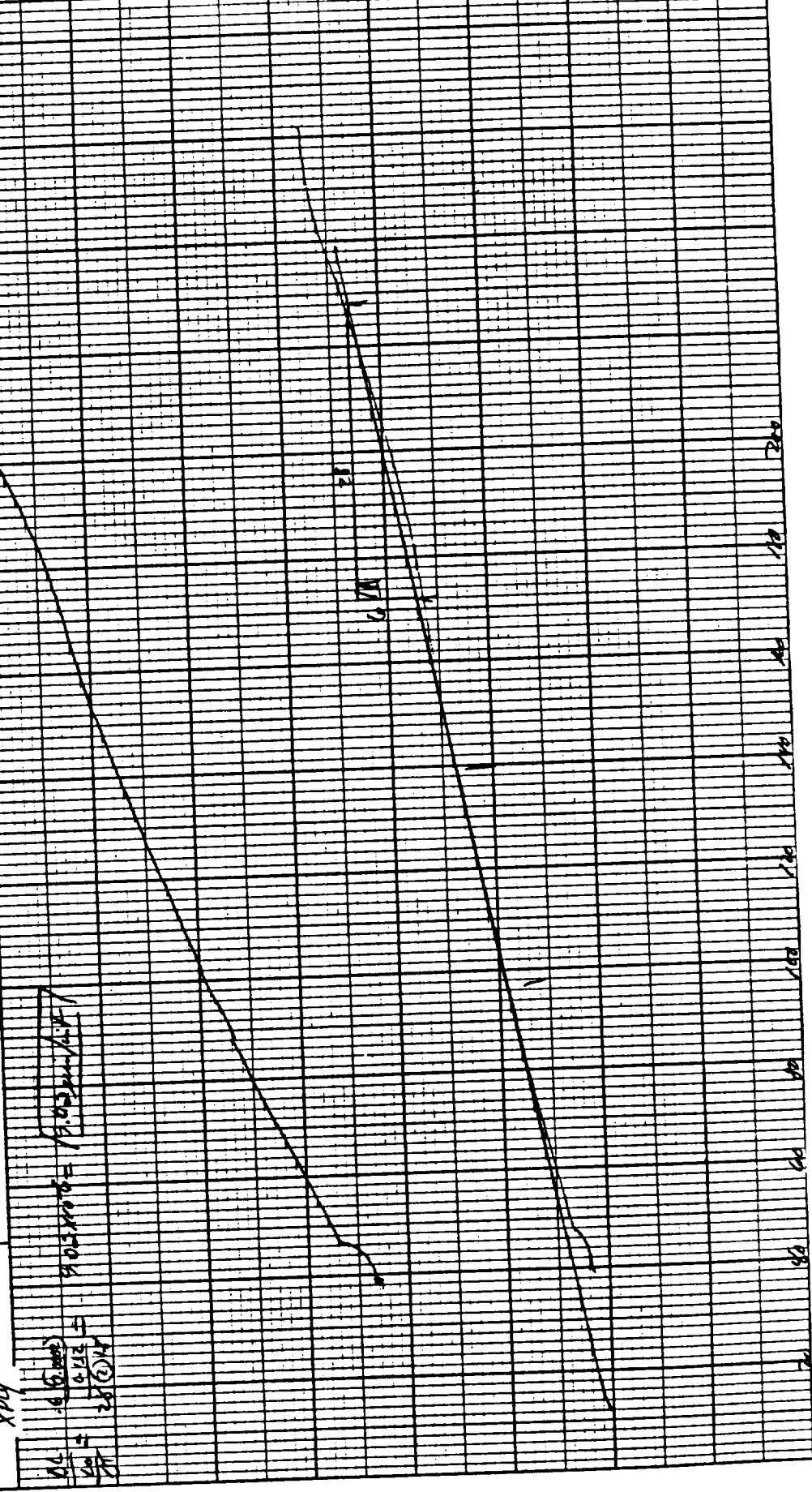
TGA
 SCALE: mg/in
 SUPPRESSION: mg
 WEIGHT: mg
 TIME CONST.: sec
 dY: (mg/min)/in

TMA
 SCALE: mils/in 0.4mm
 MODE: Thermal
 SAMPLE SIZE 0.259
 LOAD: g 20
 dY: (10X) (mils/min)/in



PART NO. 990088

RUN NO. <u>114</u> OPERATOR <u>TH</u> SAMPLE <u>COU3-7-60-6</u> ATM. <u>24</u> @ <u>XP</u> FLOW RATE <u>3.554</u>		T-AXIS SCALE °C/in <u>50/20</u> PROG. RATE °C/min <u>10</u> HEAT / COOL <u>ISO</u> SHIFT in <u>0</u>		DTA-DSC SCALE °C/in <u>(mcal/sec)/in</u> WEIGHT, mg <u>10</u> REFERENCE <u>10</u>		TGA SCALE, mg/in <u>10</u> SUPPRESSION, mg <u>10</u> WEIGHT, mg <u>10</u> TIME CONST., sec <u>10</u> dY, (mg/min)/in <u>10</u>		TMA SCALE, mils/in <u>0.1/10</u> MODE <u>EXTENSION</u> SAMPLE SIZE <u>0.132</u> LOAD, g <u>10</u> dY, (10X), (mils/min)/in <u>10</u>	
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MEASURED VARIABLE

ATTENTION TO QUALITY